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XUM

THE

VETERINARY JOURNAL

JULY 1902.

Editorials.

THE KING'S ILLNESS.

IN common with His Majesty's subjects throughout all his dominions we greatly regret that the stern decree of nature has prevented the King from receiving at the hands of the Church and of the people that final consecration which was to have taken place at Westminster on the 26th of last month. The circumstances of the case are most solemn, almost tragic, and it was no wonder if the feeling produced in the country was in the first place absolute consternation and dismay, and then the deepest pain, and the heartiest sympathy with the King and his beloved Consort. We had hoped to write our respectful congratulations to His Majesty on his Coronation, and to express our loyal devotion to his throne and his person: we must confine ourselves to an expression of grief at the sad events of the last fortnight, and of sympathy with the Royal sufferer. May it please Almighty God to restore our beloved King to full health and vigour, so that he may in the future enjoy, in the fidelity and affection of his subjects, full compensation for his sufferings at the present time and in the past.

THE ARMY AND THE PROFESSION.

THE question has been asked pretty frequently of late, why have the veterinary officers sent out to South Africa proved administrative failures? Whilst we refuse to admit that the events of the last year or two amount to anything like proof of incompetency, we think it our duty to defend the profession against the possibility of such a charge. Undoubtedly there has not been the success the country could have desired, but we are far from thinking that the blame lies with the veterinary men. A poet, we are told, must be born a poet, he cannot be made into one. But Horace gives a whole code of laws which the born poet must learn and obey if he wishes to take his place amongst the immortals. There are also heaven-born soldiers, but even they have to learn their drill, and go through the salutary discipline of daily work in order to find the points of contact with their fellows, if for no other purpose. The heaven-born

administrator, military or civilian, is a less common product of humanity, but certainly here we have not the growth of a night but the patient outcome of years of work and study. The growth of a night is, after all our wonderment, only a mushroom, and may be a toad-stool; the oak plank is the solid product of years of growth. In all human affairs perhaps the most important factor is industry; without industry genius wears itself to death in impotent friction; with industry even dulness may become respectable. Where we have industry alone the result is mere pedantry and the man is a mere plodder, but where we have the combination we have a great man, in certain combinations a great administrator. What we wish to point out and insist upon here is the importance of discipline, of training. Now if there is no school there can be no discipline; if there is no system, no opportunity of gradually developing talent, there can be no expectation of properly trained administrators. In the medical world a young man may have quite a wonderful faculty of diagnosing disease and prescribing the fitting remedy, or he may possess the most delicate skill in amputation, and yet be unable to organise an hospital; of course he may be radically incapable under any circumstances of performing such work, from some defect in his intellectual equipment, but even granting this equipment, he must get the opportunity of developing and exercising his powers. This has been provided for in the Army Medical Department, but not in the Veterinary Department. In the Medical Department there are superior officers whose duty it is to arrange for the construction and organisation of hospitals, and for the provision of an adequate staff of nurses, and an adequate supply of medicaments. It is just the same with the fighting men; they have a corp of Engineers to do the spade and shovel work, and they have a Commissariat Department to attend to their physical wants, so that all their energies can be devoted to the work of subduing the enemy. In the case of the veterinary surgeon no sufficient help is given. He understands all about horses and the diseases which assail them; he knows what food is best for them and what medicines are required, and he knows, further, the conditions of stabling and grooming and so forth which are most conducive to activity on the part of the animals. But he has not learnt, has had no time or opportunity to learn, how to organise a great field hospital; he has no means of knowing, no time for learning the capacity of a country in the way of food supplies; generally, and this is most important, he has no proper assistants—no one to correspond to the trained nurse. Is it a wonder if he loses a great many patients? The wonder is that he has done so well.

It is not an easy task to suggest how this deplorable state of matters is to be remedied. One thing is clear, and that is, the importance of the horse as a factor in warfare. If the South African War has proved this to us, it will not have been waged in vain. Let us hope, therefore, that the War Office, when once it

has recovered its breath, will give a spare moment or two to the Veterinary Department of the Army. Perhaps some distinguished officer will be appointed to give a course of lectures on veterinary organisation in some large hospital to be provided by the Government to all young veterinary surgeons ambitious of entering the Army. And just as the little known Railway Department of the Army summons its members together at intervals, and not only discusses and arranges plans for the quick transport and concentration of troops, but brings its navvies and its carpenters together and trains them in forming at great speed temporary stations, so, perhaps, this supposed distinguished officer might get Government smiths and carpenters together and show the students how best to construct a field hospital for horses. Such a course of study would be a training not only for veterinary surgeons but for their stablemen, their staff of "nurses." We all know how little good a medical man can accomplish if he has no one to support and second him, and on the other hand how enormously his powers for good can be increased if he has only to direct, and can depend for the execution of his orders on competent assistants. It is just the same with horses.

Should this plan be impossible of execution, the War Office might depute experienced officers to visit the veterinary colleges of the country and give a course of gratuitous instruction to all the students, for the late war has taught us that every student is a potential candidate for Army service. Such a plan would require the special help and co-operation of Principals of Colleges, but that could be arranged, It would be unfair to ask Principals to provide such courses of instruction at their own or their students' expense, seeing that they have no Government subventions and are unceasingly confronted with economic difficulties. But a Government Department can do all things, and by means of concentration can or ought to do them cheaper than the private citizen, however zealous. We trust that the War Office will shortly see its way to help the Veterinary Department, and that our humble suggestions may be thought worthy of at least passing consideration.

Royal College of Veterinary Surgeons.

MAY EXAMINATIONS IN SCOTLAND.

At meetings of the Board of Examiners held in Edinburgh and Glasgow on May 16th for the Written Examinations, and on and between May 20th and 23rd for the Oral and Practical Examinations, the following gentlemen passed their Final Examination and were admitted Members of the Royal College of Veterinary Surgeons :—

Dick College.—Messrs. G. E. Anderson, W. J. Colehatch, E. Dunstan, J. Forbes, F. H. Leech,* W. Munslow, M. Purcell, T. B. Redding, J. D. Whitehead, J. C. Argo,* and E. Wardrop.

Glasgow College.—Messrs. G. W. Weir,* N. H. Macalister, and H. G. Rogers.

The following passed their Third Examination :—

Dick College.—Messrs. A. H. Andrew,* W. K. Barron, C. Cameron, J. G. Catell,* R. E. Montgomery,† R. Murray, J. H. Ripley,* and W. A. Simson.

Glasgow College.—Messrs. P. F. Tubridy and J. F. Rankin.

The following passed their Second Examination :—

Dick College.—Messrs. J. C. Bowden,* J. Donaldson, A. de R. Gordon,* T. Jack, W. J. Moody,* D. S. Rabagliati,† and A. A. White.

Glasgow College.—Messrs. A. V. Maynard, W. W. Campbell, D. MacLeod, W. P. Begg, L. S. Sedgwick,* and J. B. Thorn.†

The following passed their First Examination :—

Dick College.—Messrs. C. W. Cartwright, C. R. Chadwick, A. T. Crowther, F. Davidson, W. A. Doughty, W. K. Johnstone, W. Laing, J. H. M'Crea, A. Pollard, W. Richardson, T. W. Smith, H. A. Stewart, B. Selous,* A. Taylor,* G. Taylor,* R. W. Thompson,* and A. E. Willett.*

Glasgow College.—Messrs. W. Holiday, A. Douglas,* W. Anderson, A. Jackson, W. Hill, and G. M'Call.

R. RUTHERFORD, F.R.C.V.S.
May 31, 1902. *Secretary Board of Examiners.*

Note.—The New Veterinary College results were published last month.

Royal College of Veterinary Surgeons.

FELLOWSHIP DEGREE.

10 RED LION SQUARE, W.C.,
June 1902.

A MEETING of the Court of Examiners for this Degree was held on the 10th of May last.

Eight candidates entered for the examination, and the following is a list of those who passed and duly received the diploma :—Messrs. R. J. G. Voisin, Jersey ; E. L. Stroud, Paddington ; W. S. Mulvey, Chelsea ; J. Bell, Catford ; A. A. Johnson, London ; J. G. Coley, A.V.D.

The Examiners were Professor J. Macqueen, Mr. W. Hunting, and Mr. J. Malcolm.

ARTHUR W. HILL,
Secretary.

CORONATION HONOURS.

THE KING has been pleased to approve the following appointments to be Companions of the Distinguished Service Order, to bear date 26th June 1902 :—

Veterinary-Lieutenant-Colonel THOMAS FLINTOFF, Army Veterinary Department.

Veterinary-Captain FITZPATRICK EASSIE, Army Veterinary Department.

Original Papers.

CASTRATION.

BY E. WALLIS HOARE, F.R.C.V.S.

(*Continued from page* 340, *vol.* V.).

In the last article we drew attention to the subject of hæmorrhage as one of the sequelæ of castration. An important point to remember is that in such cases careful after-treatment is necessary, and all blood-clots must be thoroughly removed from the canal, otherwise they become septic, and may lead to serious consequences.

The next sequel to which our attention must be directed is swelling of the scrotal region and sheath. This varies from a slight swelling of these parts to an extensive œdema, which may extend to the sternal region. Why it is that some colts swell to a marked degree, while others under similar circumstances show an almost imperceptible amount, we cannot explain. Of course a moderate amount of swelling in the sheath is of no account. When it becomes more extensive and hard in character it becomes necessary to see that the wounds in the scrotum are kept open, and a proper amount of exercise given. The question of non-interference with the operation wounds is one on which no hard and fast rules can be laid down. A large proportion, especially of yearlings, will do well if left alone; certainly many are better left to nature than subjected to rough handling, the application of cloths and sponges teeming with dirt and germs, and applied with still more dirty hands. Under ordinary circumstances colts do far better when left on grass and as little interfered with as possible. If under our own care, we prefer to treat the wounds on the ordinary surgical principles. If the swelling becomes extensive, free scarification will prove of service. Some cases show marked stiffness in progression, especially in one hind limb; this arises from an inflamed condition of the spermatic cord, and requires diligent fomenting and attention to the operation wounds. Great care is necessary in preventing adhesion of the end of the spermatic cord to the operation wound, as, if neglected, serious trouble may arise later on. In some instances there is a tendency for the cord to assume a semi-paralysed condition; this brings the divided end into contact with the edges of the scrotal wound, exposes it to the influence of the usually unfavourable surroundings, and to the rough handling of the attendant. Hence we believe in removing a sufficiently long portion of the cord when operating, and in avoiding any dragging on the structure. Also care should be taken not to leave an amount of bruised tissue at the end of the cord, in fact, the less damage done to this structure the more favourable will be the results. Neglect of these precautions may give rise to an inflammatory condition of the cord, or the formation of that very unpleasant sequel known as scirrhous cord, to which we shall refer later on.

Inflammation of the spermatic cord may run a favourable course and subside, or an abscess may form in the structure; when this occurs the existing enlargement disappears, provided the abscess forms close to the divided portion. It is surprising to find how diligent fomenting will cause these enlarged conditions of the spermatic cord to disappear in some cases, while in others true scirrhous cord will result. The internal administration

of iodide of potassium and its local application give beneficial results in these cases. But it is questionable whether, in cases where the cord assumes a thickened and unhealthy condition, quicker and more satisfactory results would not be obtained by casting the animal and removing the cause of the trouble with the écraseur, viz., the end of the cord which is granulating and in a constant state of irritation. Such a procedure is certainly better surgery, as it takes far less time, and all risk of scirrhous cord forming afterwards is avoided. Nothing is so damaging to the reputation of a practitioner as to have scirrhous cord occur at a future date after his operation.

Abscess in the scrotal and inguinal region usually occurs from neglect to keep the operation wounds open, and also from septic causes, such as dirty surroundings, and the dirty hands of the attendant. There is marked stiffness in progression on the affected side, the flank is tucked up and tender to the touch; there may be constitutional disturbance; the swelling is hard and brawny and does not fluctuate. In these instances the operation wounds are closed, and the animal may have been castrated from one to three weeks. The treatment is to open up the original wound, give a free means of escape for the pus, and treat on antiseptic principles.

We have seen cases in which the abscess had formed at the internal ring or in the abdominal cavity, with great enlargement of the spermatic cord. These terminated fatally. In such instances there is marked constitutional disturbance, the rectum may be pressed on by the abscess and the enlarged cord, and defæcation may be impossible.

To prevent the formation of such abscesses, of course free drainage is of the greatest importance, hence we make the scrotal incision a proper length. Indeed, in the case of small yearlings we find it good practice to enlarge the scrotal wounds after the removal of the testicles, if the latter have been small. It is also our practice to have an antiseptic ointment applied to the edges of the wounds, such as a 1 in 40 of lysol and eucalyptus in vaseline.

The next sequel claiming our attention is peritonitis. This disease and tetanus may be regarded as fatal sequelæ, and are consequently those most to be feared by the practitioner. There is no doubt but that exposure to cold is a fertile cause of peritonitis; the majority of cases occurring as sequelæ to the operation we are discussing can be traced to neglect in this respect. Other cases may occur from rough manipulation and from septic influences. We recognise a form of peritonitis occurring in from four to six days after operation characterised by extreme dulness, haggard expression of countenance, a marked disinclination to movement, a "tucked-up" condition of the abdomen, temperature about 103° or 104°, obstinate constipation and an apparent difficulty in passing urine, pulse thready and weak, and respirations thoracic in character. We have observed in these cases that no swelling of the scrotal region was present, and for a few days the animal appeared to progress favourably after operation. Treatment gives no results, and after a variable period the animals die in a state of extreme weakness, complete loss of appetite being a leading feature throughout. We have encountered such cases where there was no history of any exposure to cold, but the scrotal wounds showed a thin fœtid discharge, without any swelling either of the surrounding tissues or of the cord. It is probable that the starting-point of the inflammatory process is in the structures of the cord, and that it spreads from this to the peritoneal cavity, also that septic influences play an important part in its production.

It is difficult to judge of the percentage of cases of peritonitis that occur as a sequel to castration; among qualified practitioners it is by no means a common experience, but we frequently hear of it under the term of "inflammation," as resulting from the work of travelling gelders. The mortality among colts is very large in some remote districts from this cause, and still we seldom hear of any blame being attached to the operators; the case is different, however, with qualified practitioners, to whom the loss of a single colt often means a loss of reputation, which they do not deserve.

Can we adopt any precautions to prevent the occurrence of peritonitis? Beyond ordinary instructions and attention to cleanliness and proper housing during severe weather, the occurrence of this fatal sequel cannot be controlled by us; in this respect it resembles tetanus. One important matter is not to operate in cold weather; whether the disease arises from the direct effect of cold and exposure, or whether the latter predisposes the system to a weakened resistance to septic influences, we do not intend to discuss, but our experience tells us that cold weather is dangerous, and we must act accordingly.

Tetanus.—There is little to be said under this heading, as unfortunately it will occur occasionally in spite of all precautions, and treatment, of course, will be similar to that which is adopted in ordinary cases of this disease. The majority of the patients die. Antiseptic precautions no doubt lessen the number of cases, and if we consult our own interests and those of our clients we shall refuse to operate in surroundings that we know have been occupied by cases of this disease. We remember a few years ago, amongst a number of colts sent into town to be castrated, there was one which showed all the symptoms of the early stages of tetanus. Needless to say he was not operated on, but was dispatched quickly home, and left on grass; he recovered without any treatment, and was operated on the following autumn.

Our experience of tetanus arising after castration is that the disease assumes a very acute form, and is usually fatal. It is seldom or never recognised early enough by the owners, so that the serum treatment proves of little avail.

(*To be continued.*)

FRACTURE OF FIRST RIB.[1]

BY JAMES M'KENNY, M.R.C.V.S., DUBLIN.

THE opinion that it is impossible for only one of the first ribs to be fractured unaccompanied with fracture of some of the surrounding structures is, in a sense, not an unreasonable one, seeing that it may be argued that the latter protects the former from all external injuries, and the costal muscular power is quite inadequate to cause fracture. Owing to the manner in which the first ribs are protected, their attachments, and the office they fulfil, any violence capable of fracturing one of the first ribs must necessarily cause fracture of some of the rigid structures surrounding it, superiorly the vertebræ, inferiorly and partly anteriorly the sternum, posteriorly the other ribs, and externally the scapula. This line of theo-

[1] Read at a General Meeting of the Veterinary Medical Association of Ireland, on 28th May 1902.

rising is not merely hypothetical; it has, indeed, a basis of mechanical facts, and therefore is worthy of respect. However solid such a basis may be, if the conclusions are in fact erroneous, then it behoves us to plead ignorance or explain the phenomena. I do not purpose at present entering further on this point.

The symptoms of fractured first rib have been described by some as follows:—Elbow dropped, knee protruding and flexed, fetlock knuckled, and toe of foot only on ground. These symptoms others hold to be common to other injuries, such as laceration of the triceps muscles, fractured scapula, pisiform bone, or navicular bone, and I may say that during my thirty-five years' experience I have found somewhat similar symptoms exhibited in the above-named injuries. But, to my mind, there is no difficulty in differentiation, taking them in the above order. For instance, accompanying the foregoing described symptoms, the diagnostic symptoms may be said to be as follows:—

In cases of injured triceps we get local heat, swelling, and pain of the parts without crepitus, whereas when the scapula is fractured, on moving the leg backwards and forwards, and inwards and outwards, we get a distinct crepitus easily localised, and when we get a crepitus on abduction and adduction of the fore-leg on the affected side, which cannot be localised, and cannot be obtained on bringing the leg backwards and forwards, the first rib is broken.

Again, when the pisiform is injured the swelling at back of knee at once attracts attention, and manipulation readily decides the injury; and when the navicular is broken, usually the history of the case, alteration of the outer structure of the foot, heat of same, and pain on being forcibly brought forward, decides at least the locality of the injury. It might be said that in the absence of any of the foregoing diagnostic symptoms it would be reasonable to conclude that the first rib was broken, and I concur with the opinion; but for many years past I have been able to still further satisfy myself by obtaining the essential corroborative evidence of crepitus, and it is specially to this that I now draw attention, viz.—the crepitus of a fractured first rib can be obtained only by crossing the fore-leg near the affected rib as far as possible across the front of the sternum, and then jerking it outwards (adduction and abduction); the crepitus thus obtained will be readily felt when the hand during the process is kept firmly on the scapula, but at the same time the crepitus, although distinct, will be dull, and, of course, cannot be localised to any part of the scapula. It also will be absent when the leg is moved backwards and forwards.

In support of the above statements I relate the following cases, which came under my observation:

Case I. *Rupture of the Triceps Muscles.*—A bay gelding five years old fell when being ridden with hounds at a drop fence, and immediately on rising was found extremely lame, could not bring the leg forward, or place its weight on it. Elbow dropped, &c. (to avoid repetition the &c. refers to knee bent forward, fetlock knuckled over, and toe only on ground). This case was sent in a float to my infirmary with a letter stating that a veterinary surgeon had examined the animal a short time after the accident, and gave as his opinion that a bone was broken, and advised that the horse be sent to the kennels for the dogs. I could not detect any crepitus, but on bringing the limb forward the animal evinced much pain, and when the limb was fully extended in this position and then jerked upwards, the

pain became so violent that the horse reared and stood on his hind legs. Upon pressure being applied to the triceps pain was produced, and the parts being swollen, I diagnosed from the foregoing that the triceps muscles were ruptured. I had the animal placed in slings, and the leg supported in a manner which I will describe further on. The case apparently was doing well for five days, at the lapse of which time the patient had a severe attack of colic, and I deemed it prudent to let it out of the slings, whereupon it threw itself down and became most violent, and the owner seeing it in this state ordered it to be shot. The post-mortem revealed a fresh clot of blood immediately above the olecranon process of ulna, extending upwards to the middle of the caput parvum, which was in this situation lacerated. The caput magnum and medium were also extensively lacerated, and between the laceration of the latter there was a dark. sanguineous, glutinous fluid. There was no trace of a fracture, either of a bone, of a limb, or of the thorax. From the foregoing I concluded that the latter two muscles were torn on the occasion of the fall, and the other muscle was lacerated during the animal's straggles while suffering from the abdominal pain.

Case 2. *Lacerated Triceps Muscles and Fractured Lumbar Vertebræ.*—A four-year-old filly, while being lunged over a narrow, deep dyke with a small bank on each side, jumped short, and the hind legs consequently scraped down the bank, and the animal remained for some short time with the fore legs on the bank; then, in attempting to get on or over it, the hind legs seemed to give way, and she fell into the ditch on her back, and had to be pulled out with ropes. I was then sent for; the foregoing was the information given to me. I found her standing in the field beside the ditch, exhibiting dropped elbow, &c. symptoms; but owing to the manner in which her hind legs were placed, and not being able to make any attempt to move a single step, I examined her further, and found she could not move her hind legs—which were wide apart—that her tail was limp, and on it being raised the resisting power was absent, and on being pricked with a sharp-pointed instrument she did not exhibit any pain (paralysis of the motor and sensory nerves of the parts). These symptoms led me to examine for fracture of the lumbar vertebræ, and on causing the hind extremities of the animal to rock from side to side, I distinctly felt the crepitus of fracture, and therefore had the animal destroyed. I found the triceps muscles extensively lacerated, no fracture of rib or any of the bones of the fore limb; however, the transverse processes of the second and third lumbar vertebræ were broken into the body of the bones extending into the spinal canal, and the psoæ muscles were slightly lacerated.

Case 3. *Fractured Pisiform.*—Four-year-old black race gelding, when being lunged over stiff timber, baulked, and on receiving a sharp cut of a long-thonged whip jumped high and short, and came down with the back of its knees striking the timber. The animal was, with difficulty, taken into the stable, a distance only of a few hundred yards, and I was sent for, but did not see the horse until next morning.

The horse was standing with the near elbow dropped, &c., the same knee was much swollen, and the pisiform bone, instead of being a backward projecting prominence, lay flat on the back of the knee. On moving it (which was difficult) a distinct crepitus could be felt. Hot fomentations and the application of cooling lotions, with perfect rest and a dose of physic, were prescribed, and in ten days the animal stood straight on the

leg, and could walk sound; but it never afterwards could be trained to race, as violent exercise always caused the knee to swell, and the horse then went lame.

Case 4. *Fractured Navicular.*—A steeplechaser seven years old had been lame for many months on both fore legs, and had been kept going by the use of alternate hot fomentations and cold swabs applied from the knees downwards; however, in a race, when apparently going well, his rider said the horse stumbled several times and nearly came down, and so he at once pulled him up and got off, fearing the horse would fall. The horse was able to stumble off the course, and the owner and myself, seeing from the stand that the horse was seriously injured, walked over to it, and the dropped elbow symptoms were very apparent on the near fore legs. However, from my previous knowledge of the horse I suspected the already diseased navicular bone had given way, and, on examination, I advised the owner to have the horse destroyed; but he informed me the horse had previously been every bit as bad, and that after a few hours' fomenting he would be able to walk home, and would be fit to race in a short time. To this I replied, "I would be much obliged if you would send me both of the horse's fore feet when he dies."

Three days afterwards I received a letter from the owner stating that he had sent the horse to the knacker's, and had instructed him not to destroy the carcase until I made a post-mortem examination. I found the navicular bone of the near fore foot fractured on its inner third, and the flexor tendon, where it passes over the bone, was slightly lacerated. The off-fore navicular bone, os pedis, and flexor tendon were firmly united together, with white fibrous tissue. Neither of the first ribs nor the other bones of the fore-legs were fractured, that is, with the exception of the navicular of the near foot.

Many similar cases I could enumerate, which, in my mind, establish the fact, when we see a horse with the elbow dropped, knee bent forward, fetlock knuckled over, and standing on front of toe, with inability to place the weight of the body on it, we should only look on these symptoms as common to a number of injuries, and not diagnostic of any particular injury. At the same time I admit that in the foregoing cases the enumerated symptoms were not all fully developed as in the case of fractured first rib, when they are all very definitely exhibited.

I shall now relate a few cases of fractured first rib, with post-mortem examinations, which came under my observation.

Case 1a. *Fracture of First Rib.*—Grey gelding, six years old, a hunter. I received a telegram to attend at once, at a distance of 10 miles, a horse seriously injured in the hunting field. On my way there I met a fellow practitioner, who told me that my client had informed him that he had wired for me, but that as the horse was in great pain he would be much obliged if he would have a look at the animal and advise as to treatment until I arrived. My colleague examined the horse, and told the owner that the shoulder-blade was broken, recommending that the animal be put out of pain at once; but as I was going, not to do so until I arrived. He added to me that he had not localised properly the exact position of the fracture, but that he distinctly felt the crepitus, and felt confident that it was the neck of the scapula, or it might be the upper end of the humerus; under either circumstances he was sure I would agree with him that the horse should be destroyed, and asked me to furnish him with the further

particulars of the case. I found the horse in great pain and exhibiting to a marked extent on the near side dropped elbow, &c. symptoms; and on adduction and abduction of the leg a decided crepitus could be felt, but to obtain it the limb required to be moved as far as possible each way with a quick, decided movement.

However, failing to localise the fracture of the bones my friend had named, and as the crepitus was dull, though distinct, and not being able to obtain it by any other movement of the leg, my past experience of these symptoms led me to definitely form the opinion that the first rib was broken. The owner had left a note for me with the groom, instructing me to have the horse immediately destroyed if I agreed with the professional opinion already given; but, under any circumstances, I was to give the groom a note which he would at once convey to him. This put me in a dilemma, as I had a decided objection to *point blank* disagree with the opinion already given, and yet I would not stultify myself in the matter; therefore I wrote stating I agreed with my colleague as to the fact that the horse was suffering from a fractured bone, but that as the animal was a valuable one I requested that it be submitted to treatment. I requested that if the owner wished to act on my recommendation he should wire me, and I would at once attend and bring the necessary appliances; but that if he had the horse destroyed I would feel obliged if he sent it to the knacker in the city, so that I might make a post-mortem, as the case was of much interest to me. Next morning I received a wire stating that the knacker named had come and destroyed the horse, and taken the carcase away, and had received orders not to dispose of it until I gave permission. My colleague and myself made a post-mortem, and found the first rib broken, but no other fracture or injury to account for the symptoms exhibited previous to death.

Case 2A. *Fracture of First Rib.*—Valuable hunter, cost £250, went brilliantly in a long hunt, and was being ridden home; but, to shorten the distance, was taken across a few fields and jumped over a small ditch on to a bank of collected road stuff covered with grass. The horse bungled on landing, and nearly came down on to the road. The rider at once got off, and expected to find the horse's heel cut, or something in the foot, but he did not discover anything to account for the mishap; so, previous to re-mounting, he thought it advisable to walk the horse for a short distance. However, to his astonishment, the poor beast when it attempted to walk, the moment the weight came on the off fore leg, nearly fell, and it was with great difficulty that he was got home on three legs. Two veterinarians, who were at the hunt, examined the horse, and said the shoulder was broken, and advised that the animal be at once destroyed. I was sent for, and as the horse exhibited similar symptôms to those of Case 1A, I pronounced it was suffering from fracture of the first rib, and advised treatment. In three months the horse was perfectly recovered, and twenty-seven weeks from the date of the accident he was sold at a fair profit, being passed as sound by one of the two veterinarians who had seen him when suffering and had ordered him to be shot.

The treatment was as follows:—The animal was placed in a loose box, at the near side, close to the wall, and at about a foot from the off side was fixed a strong pole, which, in front, was on a line with the point of the shoulder, and behind, a little below the stifle. A chain was attached from the head collar to the wall in front and above the head, and one on each

side of it, but lower down. By this means the animal was prevented from lying down, or moving forwards, backwards, or sideways; at the same time the animal could be easily attended to, and was not smothered as it would be if placed in a narrow, high stall. The floor was covered deeply with peat moss, mixed with sawdust and sea-sand equal parts. Having thus attended to the animal's comfort and sanitation, I placed and retained the off fore leg in the most suitable position with the view of favouring union of the fractured rib and preventing atrophy of muscles. I wish to draw particular attention to a simple but effective arrangement, viz., a splint made of thick, strong leather, lined with thick felt projecting over the leather. This splint is shaped to fit the forearm, from the elbow to a little below the knee, and having suitable straps on either side, so that it can be properly adjusted and securely fastened to the forearm with the open side in front. Upon the centre of the external surface of the splint a ring is firmly and securely attached, and, when in use, the ring is found at the back of the forearm. It is further necessary to have a good, strong surcingle with a suitable ring secured to it, so that when in position upon the horse the ring will be underneath. When the splint and surcingle are fastened on to the horse, a strap is passed through the rings on the back of the splint and lower surface of the surcingle, and, on being drawn together, the elbow assumes its normal position, and on fastening the strap, the structures remain in the position. Parts are thus fixed, and those who see the effect for the first time, I have always found, express surprise at the immediate relief the animal seems to obtain. Sometimes it is necessary to place the fetlock in poroplastic splints or plaster bandages.

I could enumerate many other cases exhibiting similar symptoms, and which I diagnosed as suffering from fracture of the first rib, but they recovered under the treatment I have described.

I have selected cases in which a difference of professional opinion occurred, and, as in each case my diagnosis was confirmed by post-mortem, and, fearing this report will stamp me as an egotist, I will state another case.

Case 3A. *Fractured First Rib.*—A high-class stepping harness horse came into collision with a van, and was thrown down. The owner came for me, and we at once drove to the scene of the accident—a rather crowded thoroughfare—and I scarcely need say a very large concourse of people had collected. On examining the animal I distinctly felt a crepitus when the leg was drawn outwards and inwards, and I said the bone was broken, believing the scapula was fractured, and advised that the horse be at once destroyed. This the owner agreed to, and the knacker very quickly was on the scene and ended the poor beast's sufferings.

I made a post-mortem, and to my chagrin found the scapula perfect, but the first rib was broken. I may under the circumstances be excused for the error, especially when I state that it occurred many years ago, and the dropped elbow, &c. symptoms were not then closely studied by me. I hope, however, I understand them better now.

Before I conclude I shall submit one case more, although owing to complications it is not a typical one, but it is of special interest, inasmuch as I brought it under the notice of several veterinarians, and gave them the opportunity of examining the horse, and although they did not positively disagree with me as to my diagnosis (fractured first rib), yet they expressed some doubt as to its correctness, and concluded by saying they would agree with me if on post-mortem the rib was fractured.

I promised them that should such an examination become available, I would send the horse to the Royal Veterinary College of Ireland so that an independent unbiassed post-mortem examination would be made. Fortunately, or unfortunately, the horse died of "septicæmia," and I had the carcase sent to the College as promised, and the Principal (Professor A. E. Mettam) made the post-mortem, and kindly consented to attach the result of the same to this report.

CASE 4A. *Fractured First Rib.*—A high-class hunter, when being ridden with hounds, partly refused to jump a narrow deep ditch with a raised bank on the landing side, the hedge on which had recently been closely cut down. The rider finding the horse unwilling to negotiate the obstacle, steadied it by crossing the bit in its mouth, and then bringing it straight at the ditch, but slowly. When the horse was within a few yards of it the rider held its head straight and fairly tight, and plunged the spurs into its sides, whereupon the horse plunged forward and made a poor attempt to jump the dyke and up the bank, with the result that its fore parts struck the bank and the animal fell on its back into the deep narrow ditch. Strange to say, the same day five other horses also came down at various parts of this apparently not difficult jump. The horse in question had to be dragged out of the ditch, and it then was bleeding freely from an extensive wound situated below the head of humerus, between it and the sternum, and injuring the pectoral muscles. Seven large handkerchiefs were at once tightly plugged into the wound, and by this means the hæmorrhage was decidedly checked, but it was found that the horse could not place any weight on the off fore leg, and it was with difficulty that the animal was brought on three legs to a stable close at hand. A telegram was sent to me, and on my arrival I found the horse in much pain and exhibiting the dropped elbow, &c. symptoms, coat staring, shivering violently, and weak, evidently from loss of blood. I gave the horse a stimulant, removed the handkerchiefs from the wound, and had it washed well with tepid water, to which I added a little Jeyes' fluid; I afterwards dressed the wound with carbolic oil, and dusted iodoform over it. I purposely omitted until now to state that I distinctly felt a dull crepitus on adduction and abduction of the leg, but could not get any crepitus on moving the leg backwards and forwards; therefore, as from my experience I hold that the foregoing symptoms are diagnostic of fractured first rib, I unhesitatingly and definitely made the statement, but owing to the wound could not give a favourable prognosis; however, I advised that the animal be removed to my hospital in a float, and that I would do the best I could for it. Having arrived at my infirmary I put the horse in slings, as it was very weak, and applied the splint already described. The horse apparently was going on satisfactorily, with the exception of having a high temperature, until the morning of the tenth day; on that morning it received a mash of bran mixed with a little boiled flax seed, and it at once began to eat, apparently with a good appetite. In a few minutes, however, a noise was heard in its box, and my assistant, who was about 10 yards away, ran to see what was the cause, and was astonished to see the horse plunging and kicking in a most frantic manner; so violent were the struggles that it was highly dangerous to go near it. This state of matters lasted for about ten minutes, when the animal suddenly collapsed and remained in a comatose condition for about fifteen minutes and died.

The following is Professor Mettam's report of post-mortem examination:—

"Through the kindness of Mr. M'Kenny I had an opportunity of seeing his patient during life, and the privilege of a post-mortem examination at the College after its death. I had no difficulty in perceiving the crepitation sounds when the fore limb was adducted and carried across the mesial plane of the animal, and then abducted. That there was a fracture somewhere I had no doubt, but as to the exact site I was somewhat sceptical. However, the post-mortem examination revealed the following :—

"There was a large wound at the root of the neck and anterior to the thorax. It passed through the mastoido-humeralis and anterior deep pectoral muscles. There was no pus. The muscles injured were black, and the fascia in the axilla around the axillary vessels and brachial plexus was discoloured, in part due to extravasated blood, and in part due to post-mortem decomposition.

"I removed the right fore limb to examine carefully the anterior ribs. The right first rib was found fractured at about the junction of the upper and middle third, at the place where the smooth area is provided on the rib for the brachial plexus. The upper end of the lower portion of the rib was internal to the lower end of the upper segment ; the edges were smooth and rounded off, as if there had been a good deal of movement between the two ends of the rib. The condition of the two ends disposes of any doubt as to whether the rib was fractured prior to death or after, and is exactly what is to be expected to occur when the two ends of a bone are in close proximity and cannot be retained in exact apposition. The outer edges of the opposed segments were rounded, the inner was still sharp. On preparing the specimen for the museum, the second rib of the right side was found to be fractured ; this passed obliquely through the neck of the rib. There was little or no displacement. Here there was an attempt at repair, but such was not the case with the first rib. This discovery shows how necessary it is that a careful and detailed examination of other ribs than the first should also be made. Careful dissection down upon the fracture of the first rib showed that there was a small septic abscess ; the pus was small in amount, chocolate coloured, and apparently consisted of pus and blood. I made films of this, and, of course, found it teeming with micro-organisms, chief among which were the bacillus of maligant œdema, streptococci, and staphylococci.

"It was found that the fracture had caused a perforation of the pleura, and the superior part of the anterior lobe of the right lung was adherent to the chest wall. A septic infection of the chest was found ; the fluid in the chest and the soft exudate upon the pleura had a strong septic odour. There was a septic broncho-pneumonia. The heart was flaccid ; the wall of the right ventricle was thinner than normal. The endocardium showed hæmoglobin staining, as did the lining of the large vessels leaving the heart. There were large patches of extravasation beneath the endocardium covering the papillary muscles. The walls of the pulmonary artery were thin.

"As to the abdominal viscera, the stomach and intestines were normal, so also was the right kidney. The liver was in a condition of cloudy swelling, the left kidney had a cyst in it, the spleen showed numerous petechiæ beneath its peritoneal covering, and also an elongated depressed scar upon its surface. The aorta and its branches were normal, and so was the vena cava and its tributaries.

"The ventricles of the brain contained relatively a large amount of fluid, dirty yellow in colour, and stinking horribly.

"The cause of death was, of course, septicæmia.

"The fracture, in my opinion, was produced by the object struck when the animal made the attempt to jump, the same object that produced the wound. After striking the rib, the stake, or whatever it was, was deflected, and continued its course further under the scapula.

I think the dropping of the elbow is to be explained by an injury to the roots of the brachial plexus, from which the musculo-spiral nerve (or radial) is formed. These roots are the branches derived from the first and second dorsal nerves, and in view of the site of the fracture it is difficult to imagine how the nerves could escape injury. I cut sections of the musculo-spiral nerve, of a portion taken from the nerve where it disappears behind the humerus, giving off branches to the triceps and other muscles, but could not satisfy myself that there was any extensive degeneration such as one would associate with the train of symptoms observed."

Mr. M'KENNY stated that, since writing his paper on "Fracture of First Rib," he had had two cases that more or less bore on the points brought out in his paper. A horse was brought to him one evening; the history of the case was this:—At the corner of Harcourt Street, a distance of a few hundred yards from his establishment, the animal was "shafted" in the lower portion of the neck; it walked down his yard perfectly sound, but very weak. When he got within ten yards of the animal, he could hear the heart audibly, and from the propped position of the legs, &c. he saw that death was approaching; the membranes were very pale, and he told the man he could do nothing for the horse. There was no wound outwardly visible, only a flap of skin, but on raising this an inch or so an opening was found in which you might easily put your hand, the skin forming a regular valve. The horse was bleeding profusely from the nose and mouth, and from the wound when the skin was raised; it died in a few minntes. On making a post-mortem examination he found the second, third, and fourth ribs broken. Now the animal walked in sound, there were no dropped elbow lesions, and he thought that to a certain extent the case was of interest in connection with his paper.

The second case he would ask their attention to was that of a brood mare he was sent for to see some ten days previously. The owner could not say whether the animal was kicked or had fallen, or how the accident happened. The owner and those with him considered the shoulder was dislocated, as there was a large swelling. On going into the stable the animal had all the appearance of dropped elbow, and he (Mr. M'Kenny) considered it would be well to state the symptoms he noticed on that occasion. The animal, instead of attempting to put any weight on the leg when asked to move, raised the fore part up, and did not put any weight on the limb. In "dropped elbow," as he understood it, the animal will try to put weight on the leg and sink under it. In that particular case it did not attempt to do anything of the sort, but simply raised up the injured member and went on three legs. He had the shoulder fomented, and applied a cooling lotion (sugar of lead), and was very pleased to say that the animal was now able to walk. If the symptom of dropped elbow was exclusively that of fracture of the first rib, certainly there was a case of it; but the symptom in his opinion was one common to a great number of cases, as was explained in his report.

RABIES: SYMPTOMS DEVELOPED AFTER TWO YEARS.

In August 1900 a dog belonging to Mr. J. R. Jones, Glanamman, bit several people at Brynamman and Glanamman, and, suspecting that the animal suffered from rabies, the victims were sent to the Pasteur Institute, Paris, at the expense of the Llandilofawr Union. They all apparently recovered, and nothing has been heard of any after-effects from the bite of the mad dog until, with great suddenness, a man named Thomas Bowen, a carpenter, employed at the Gellyceidrim Collieries, was reported to have expired from a virulent form of hydrophobia on Wednesday evening last. It has every indication of having been a genuine case of this dread disease.

The victim, Thomas Bowen, who lived with his son, Isaac Bowen, at Brynhowell Cottage, Garnant, was sixty-six years of age. He was a strong, muscular man, about 5ft. 11in. in height, very active in his habits, and in robust health. There seemed to be nothing wrong with Thomas Bowen until the beginning of this week. He went about as usual on Monday, and even walked to the doctor's on Tuesday evening. By that time, however, he exhibited strong symptons of hydrophobia, and after twenty-four hours of the greatest agony he died, as the doctor's certificate states, from exhaustion supervening hydrophobia.

Dr. D. C. Rowlands gives a detailed account of the case. "To give you its history from the beginning," he said, "it was in August of 1900 that a little boy named Evan Jones, son of Mr. David Evan Jones, near New Bethel Chapel, was bitten by a fox terrier. The dog afterwards found his way to the Amman Commercial Hotel and bit the servant girl there on the heel. From there the dog went in the direction of Caeglas Cottage, where Thomas Bowen happened to be, and he tried to drive him out of the house, and in doing so was very badly bitten on the right thumb and the index finger on the same hand. That same night David Evan Jones brought his child, and Thomas Bowen also came to me to be cauterised. They were afterwards sent to the Pasteur Institute for treatment, and came home apparently none the worse for what had happened. The dog after leaving Caeglas went to John Price's house, where he was shot and buried in the garden. I reported the matter to P.C. Tudor, the sergeant being away on his holidays at the time, and it was brought to the notice of the Chief Constable. The dog unfortunately, being buried in the garden, was not examined. Now all this has long ago been forgotten, and no one apprehended any serious result from it. On Tuesday morning of this week, at about 8.30, Thomas Bowen came to my surgery in the company of his son-in-law. He complained of vomiting, retching, and wind on the stomach. I prescribed for him, but he was unable to take the medicine. About eight o'clock in the evening he went to see Dr. Howell Rees, and symptoms of hydrophobia were at this time evident. I have taken a note of the symptoms with the intention of reporting the case to the *Lancet*. There were spasms, a difficulty in swallowing, a dread of any current of air —I should say draught—a dread of water and of light. There was also a difficulty in breathing, and a most unnatural and unearthly sound came from the throat. I noticed a protrusion of the eyebrows and a smile sometimes broke over his face and suddenly changed into a picture of horror. He also had spasms, and once or twice when he was reclining at full length on the bed he would start up in an erect attitude and nearly fall out of the window. He was very restless, and it required three or four to hold him

down. There was an escape of saliva at the mouth and difficulty in expectorating. In taking his pulse I found he was very sensitive, and at a cold hand he used to twitch. This sensitiveness to cold was first noticed when he was examined by Dr. Rees on Tuesday night. The two men with him had to hold up an umbrella to his face to shield him from the breeze. As an instance of his difficulty in breathing, I might say that between one expiration and inspiration I counted twenty-five seconds. The symptoms first appeared on Tuesday evening, gradually growing worse, and the patient was in great agony. About an hour before his death he became very exhausted, and died at 8.30 on Wednesday evening. I stayed with him all Tuesday night, and went to see him every two hours on Wednesday. He was treated by injections of morphia to keep him quiet, and was stimulated by enema to maintain his strength."

SOME DISEASES INCIDENTAL TO PREGNANCY AND PARTURITION IN THE COW.[1]

BY A. M. CRICHTON, M.R.C.V.S.

MR. PRESIDENT AND BROTHERS—When your Honorary Secretary, J. J. Vahey, Esq., wrote asking me to write a paper for the meeting to be held in Belfast during the Spring Show week, I at once complied with his request, not because I had anything very startling or original to bring before you, but it was rather the result of the letter that he wrote to me complaining about the difficulty that he had to get the North of Ireland members to read a paper at the meetings, so I thought so far as I was concerned I would remove the stigma from off my shoulders. Now the few remarks that I will make I have no doubt will not be new to you, but I trust that what I have to say will be the means of causing a good discussion, and that it will be to the mutual benefit of each brother here present. I had some little difficulty in choosing a subject, but in the one I have chosen I mean to draw your attention more to the practical rather than the scientific side.

The first that I will draw your attention to is

PARTURIENT ECLAMPSIA.

Definition.—An epileptic and convulsive affection, affecting the cerebro-spinal nervous system, accompanied by tonic and clonic spasms of the muscles of various regions of the body. It occurs in cows both before and after parturition.

Causes.—Opinions differ in regard to the causes; by some it is supposed to be due to the retention of urinary elements in the blood, by others to hyperæmia of the brain, and by others still to reflex irritation of nervous system, which brings about renal insufficiency and albuminuria, and exposure to cold winds and wet may bring on the disease.

Symptoms.—The cow takes suddenly ill by foaming at the mouth, champing the jaws, full wild staring eyes, excited expression of countenance, head turned to the side, sometimes pulling back on the chain, licking at

[1] Read at the Quarterly Meeting of the Irish Central Veterinary Association on 1st May 1902.

fore leg, edge of feeding trough, or anywhere convenient; some cows bellow, others don't; twitching of the muscles of body and limbs, sometimes difficulty of respiration, sometimes cow becomes comatose. Most cases occur after calving, those which occur before are generally about mid-term, and in heifers. The attacks after calving generally occur from eight to sixteen days afterwards. The disease occurs in cows of all ages, and generally in cows of lean condition. The reverse to this happens in parturient apoplexy, as it is a fat cow and a good milker that goes down with it. The most of cases do not get off their feet, although I have had them that did, and lay for a night before getting up again. It might be possible to confound this disease with parturient apoplexy, but if we are careful to note the symptoms it should not happen. I will endeavour to point out the essential differences between the symptoms of the one and the other. There are about eight prominent symptoms that we should bear in mind when we are called in to see cases of this description. I will enumerate them as follows :—

Parturient Apoplexy.

It mostly occurs in cows at third calving and afterwards.
It never occurs before calving, and generally within forty-eight hours thereof.
One attack predisposes to another one.
Most common in fat cows.
Patient fails to keep standing.
Rapidly followed by coma.
Earliest period of recovery is generally eight to sixteen hours.
Prognosis generally very unfavourable till Schmidt treatment found out; now more favonrable.

Parturient Eclampsia.

Occurs in cows of all ages, but mostly at first and second calving.
Occurs in cows before calving; if after calving hardly ever before the eighth to sixteenth days.
One attack not necessarily succeeded by another at next calving.
Most common in lean cows.
Patient mostly can stand through attack.
The cow only occasionally becomes comatose.
Recovery takes place in a few hours generally.
Prognosis favourable and the treatment successful.

Now, gentlemen, these are the principal features in contrasting these two diseases, and I will now give you the most successful treatment that I have found for this disease after trying several remedies.

Treatment.—First get the cow made comfortable in a good warm box or byre free from draughts, and as the morbid condition of the nervous system may be brought about by cold winds, wet, or draught, it is necessary to do this most needful part of the treatment. Then if the bowels are correct I give no laxative, but prescribe from ʒiss. to ʒii. ext. belladonna every three hours as long as necessary; bleeding may be resorted to if the foregoing treatment fails, but this is not usually the case. If kidneys don't act promptly and sufficiently I prescribe ʒii. spt. ether nit. in a little cold

water, or along with the ext. belladonna ; give about two quarts of linseed tea every few hours if the animal will have it, and this is usually all that is necessary for the treatment.

ABORTION.

Definition.—The expulsion of the fœtus and the fœtal membranes before the natural period. Abortion may be considered under two heads, non-contagious and contagious, and I will just consider the sporadic or non-contagious form. The normal period of utero-gestation in the cow is about nine and a half months, some more, some less, and an abortion usually takes place from the third to the seventh or eighth month. After that month it may be termed a premature birth.

Causes.—These are very numerous and they may be divided into internal and external. Of the internal causes the general health of the cow is of the greatest importance, any contagious or febrile disease in the system of the mother is a cause or factor in bringing about abortion, such as tuberculosis, pneumonia, indigestion, gastric tympany, excitement, nervousness, ergotised food, and of course the infecting bacillus.

External Causes.—Cold and wet, changes of temperature, thunder and lightning, frights, narrow doorways, pressure over the uterus, over-exertion, foul smells, icy-cold water, too much food, putrid stagnant water, sewage, frosted turnips, potatoes or roots of any kind, or rotten roots, mouldy bad hay, &c. &c.

I now come to the contagious form of abortion, and in giving the treatment for the sporadic variety I fancy it would be better to consider the treatment of both together, which I intend doing. This is by far the most serious disease of the two under consideration, and it is due to a special bacillus, which I believe was first demonstrated in the year 1895 by Professor Bang, he having made a series of post-mortems of cases, and also made several examinations microscopically of the liquid between the walls of the uterus and the envelopes of the fœtus. In cases that showed premonitory symptoms of abortion he had the cow killed and the experiments carried out as before mentioned, and in every case that he examined this liquid from the womb of the affected cow he could demonstrate the presence of this bacillus in great numbers, and they were unmixed with any other organisms. So, gentlemen, this surely places the theory of contagion beyond doubt. Professor Bang also cultivated this bacillus outside the animal body. He found that it was not easily cultivated by the ordinary methods, but he succeeded in growing it in blood serum rendered solid by the addition of gelatine and agar, and when it was grown in this medium it exhibited quite remarkable characters, absolutely distinguishing it from any other known pathogenic organism. In subsequent cases Professor Bang demonstrated the same bacillus in the discharges from the uterus or vagina of cows that had aborted. So you see, gentlemen, that contagious abortion is really a disease due to a specific organism. Another way in which its contagiousness has been demonstrated is by taking part of the discharge from an abortive cow and putting it into the genital passages of a pregnant cow, and in nearly every case the cow will abort some time afterward. I also believe that this bacillus is able to multiply outside the animal body, even in soil, dirt, or manure, and this may go a great length to demonstrate the first outbreak in a herd that was previously free from this disease, and it is sometimes very difficult to know where the contagion comes from in

the first case in a herd of cows. But in reality it comes from some source, from an apparently healthy, newly bought cow, or from the land they are grazing on having been previously grazed by some infected cow; or from feeding stuff or fodder imported or brought to the byre from an infected place. There is always a cause for everything that happens in this life.

This bacillus is supposed to gain an entrance by the vulva into the womb, or become absorbed through the mucous lining of the vulva into the circulation (because abortion can be produced by injecting the bacillus hypodermically), it then gets into the circulation, locates itself in its *habitat*, so to speak, and sets up the symptoms that we see terminate in the expulsion of the fœtus and membranes prematurely.

Causes.—The primary cause is of course the bacillus. How does it get there? It is sometimes due to an infected bull, during copulation. Sometimes to a newly purchased cow brought from a tainted herd; this will bring it into a byre that was never known to have a previous case, and generally when one cow aborts there are several if not all in the same house. One reason given for this is the contagious nature of the disease, and if a cow retains the after-birth there is always a discharge of infective material, and this soils the tail and thighs, and by means of the tail the infective material is switched about to the other cows in the same house. It may also be disseminated by the discharges into the gutters running past the other cows. By inserting infective material into the genital passages of a healthy pregnant cow, you will generally have abortion in from fifteen to thirty days. As a rule the cow's health is not much affected; it is purely and simply a disease of an infective nature that affects the vagina and womb, fœtus and fœtal membranes of pregnant cows, mares, and ewes.

Prevention and Treatment.—I intend to make this as short as possible. To consider measures of prevention we must think about what will keep a stock in health as well as to the measures that are necessary to bring an outbreak to a speedy termination. With regard to the former, every person that buys a cow is exposed to getting his herd infected. When buying a new cow, isolation for a period is a safe plan. On buying a new stud bull isolate for a time, and disinfect penis and genitals for some time before using him for stud purposes. There is a big risk in keeping a bull for the service of outside cows: he should be disinfected and washed after each service.

To bring an outbreak of this disease to a speedy end there are a great many difficulties which present themselves to us. The first is that for weeks, and probably for months, a cow may be affected, and capable of infecting other cows without presenting any symptoms pointing to her dangerous state. It, therefore, often happens that before the existence of the disease in the herd is suspected and realised a lot of the cows have become affected. A cow is infected before she has aborted, but she is more dangerous after and for several weeks, as she then liberates an army of bacilli capable of infecting all the other cows in the herd. When she aborts, it is a good plan to burn the fœtus and membranes; if this can't be done bury them away from access to cows, and disinfect them before burial and over the grave put some quicklime.

The cow-house will require to be disinfected often and thoroughly, and the cows therein will also require to have the vagina washed out and tail and thighs, udder, and even up the sides, over the back, &c., in fact as far up as the tail reaches, well sponged or brushed with a reliable anti-

septic to destroy the bacilli, and the more thoroughly and frequently this is done the better chance of eradicating the disease. There are various agents that may be used for this purpose; some taint the milk and are not practicable. Sulphate of copper is good to use and does not taint the milk —six ounces to one gallon soft water, also sprinkle the floor and gangway with powdered lime; and as a further precaution the outer genitals, root of tail, and in fact the whole tail, it is well to sponge once a day with a solution of Jeyes' carbolic, or hydrarg. perchlor.

℞	Hyd. perchlor.	ʒiiss.
	Acid hydrochlor.	ʒiiss.
	Aqua	Cii. 2 gallons.

This solution is dangerous, and any of it that is left should be buried, and it can't be prepared in metallic vessels, for it corrodes them. This disease in its treatment involves a great deal of trouble and labour. When the number of the cows that have aborted is many and no chance of isolating them, the best plan is to put the aborted cows at the lower end of the house, so that the urine does not run past the healthy ones; this will reduce the risk of infection. If a cow aborts this year it does not follow that she will abort next year; in fact, experience shows that it is the exception, not the rule.

In regard to the manure, is it not possible that the abortion bacillus will retain its vitality for a length of time in it? I would recommend in this case that the manure be mixed with a sufficiency of lime and left for a good long time before being put on to land that cows will be grazed on afterwards. I must say that the wooden cow-houses, when they get rotten, and without paved gutters, the want of cleanliness, houses badly lighted, badly ventilated, badly drained, and in some cases not drained at all, all militate against the V.S. in stamping out any contagious disease in this country.

INVERSION OF THE UTERUS.

This is a very serious condition in any female animal.

Causes.—Retention of fœtal membranes, irritation of mucous membranes of the organ at the time of parturition, wounds, scraps, hard calving, injuries during calving, over-feeding, tympany, indigestion, icy cold water to drink after calving.

Treatment.—Now when a cow does put out her uterus, the first thing to do is to get to the case as soon as possible after you have been notified about it. Some farmers know to wrap it up in a damp, hot blanket, and send at once for the V.S., and when he arrives the first thing he should do is to remove the cleansing if necessary. Cleanse the organ, dry it with a cloth, and put some antiseptic and soothing dressing upon it, preferably an oily preparation, and return it by gentle manipulation, and put on a truss or West's uterine clamp, not screwed up too tightly to prevent the animal urinating or to hurt the vulva. The cow generally strains a good deal after this. To combat this we give some anodyne mixture, chloral hydrate, chlorodyne; raise the hind quarters with freshly cut sods. There is some danger of metritis, so a little tr. aconite and a mild laxative will prove very beneficial.

RETENTION OF FŒTAL MEMBRANES: SEPTICÆMIA.

This disease is due generally to a cow calving before the natural period,

or from debility, weakness, want of blood, and mostly happens in hot weather. Dealers' cows that are "fained" and "trained" are very liable to retain the cleansing, and so are very liable to have septic poisoning.

Causes.—The anatomical arrangement of the uterus in the cow, difficult parturition, abortion. Aged cows retain the membranes longer than young ones as a rule. Contraction of the cervix uteri will prevent expulsion of the fœtal membranes. Cows driven long distances to fairs and trained long distances produces fatigue and reduces the general health of the animal.

Symptoms.—Usually part of the membranes protruding, but if not, there is a certain amount of shifting of the feet, uneasiness, urinating and passing fæces often; then there is twitching and curling of the tail. One very prominent and reliable symptom is the tail is carried further off from the body than usual, in a kind of an arched manner. If putrefaction has commenced there will be a dirty, sanious, offensive discharge from the vulva, mingled with shreds of putrid membrane. At this stage there is generally constitutional disturbance, the animal is dull, dejected, appetite lost or bad, respirations hurried, temperature elevated, secretions suspended. The complications that follow this state of affairs are generally septicæmia, metritis, metro-peritonitis, vaginitis, leucorrhea, &c.

Treatment.—If the membranes are not expelled in three or four days or less they are better removed, and the uterus irrigated with a solution of ozophene, chinosol, or suitable disinfectant. There are various preparations that can be used for this purpose—carbolic acid, chinosol, ozophene, Jeyes' fluid, pot. permanganate. I find about two irrigations sufficient. If cow strains badly I give anodynes. If in weak health and low of condition, tonic and external antiseptics are indicated. If septicæmia is feared, give plenty external antiseptics, with tonics, stimulants, and good food, easy of digestion and assimilation, and try to keep the animal's strength with milk, eggs, gruel, &c. Sulphites, hyposulphites, sulpho-carbolites, quinine, hydro-naphthol are indicated, and to prevent infection of healthy subjects patients should be isolated, the excreta promptly burned, and covers, &c. used by them disinfected before being used with other cattle.

INVERSION OF THE VAGINA,

Or "showing of the reed," as the farmers call it in this district, is often seen in cattle. The causes are injuries, rupture of the internal bands that hold the organ *in situ*, constipation, protracted parturition, fatigue from long travelling after parturition, abortion, placental retention. Old cows when heavy in calf show it often. Low stand behind, and too much fall for the stand, so that when the cow lies down the whole weight of the calf, stomachs, bowels, &c. are thrown back on the os uteri, and this tends to relax passages and to force out the vagina.

Symptoms.—Generally makes its appearance when the animal is lying, and mostly seen in pregnant cows. The vagina differs in appearance from the uterus, as there are no cotyledons on it, and it is also of less volume, with a small round orifice in the centre.

Treatment.—Cleanse and return it after dressing with a little ol. carbolic. This is not a very dangerous affection, although it is sometimes very troublesome. I had a case here a short time ago; this was a prize Kerry cow, and she wore a truss for three months before calving, and she calved here a few

weeks ago but did not cleanse; the os contracted very shortly after calving, and I could not remove the cleansing, but I irrigated the uterus with a solution of ozophene 1.30, and she has done well.

LEUCORRHŒA,

Commonly known as "The Whites," is a chronic discharge from the vagina and womb, of a white flaky colour; sometimes inodorous, at other times of a rusty colour, and muco-purulent, and very offensive.

Causes.—Debility, difficult parturition, uterine excitement, polypus, prolonged irritation of the genital passages, and as a sequelæ to tuberculosis. Sometimes the bull gets balanitis, and gives the cow he serves the disease, and sometimes she aborts.

Symptoms.—Discharge from vulva, which is generally pale, bloodless, and flaccid, in other cases where discharge is flaccid, mucous membrane is rough and reddened and thickened, with stricture of the vagina as an accompaniment; animals so affected are frequently in œstrum, but very uncertain as to breeding, and if they do become pregnant they very often abort. Some constitutional disturbance is usually present, the milk diminished, the appetite very indifferent, and the animal fails in condition.

Treatment.—In the primary stages, cleanliness, frequent injections of tepid water with weak solutions of alum; zinc sulph., pot. permanganate. The administration of a saline laxative, followed by tonics and laxative diet. In secondary or chronic cases, injections of tannic acid, ferri sulph., boric acid, iodoform, or if the discharge is offensive acid carbol. 1·40 or ozophene 1·30 may be used. Internally, mineral tonics, iron or copper, for preference with quinine, with generous laxative nutritious diet, will generally result in a cure.

METRITIS AND METRO-PERITONITIS.

Definition.—Inflammation of uterus, inflammation of uterus and peritoneum. I shall consider these diseases under two heads—(1.) Simple metritis is the simple inflammation of the organ; (2.) Septic metritis inflammatory action due to the presence of a bacillus in the uterus and in the discharges therefrom.

Causes.—Unskilful and rough usage at calving, injuries, colds, draughts, retention of placental membranes, external violence, septic infection.

Symptoms.—Usually ushered in with rigors, pain on pressure over region of womb. Tumefaction of the vulva, with heat and dryness; then follows a discharge of purulent offensive matter from the vulva, increase of temperature, quick small pulse, increased respirations, grinding of the teeth, secretion of milk suspended, bowels constipated; on passing fæces animal evinces pain; on examination per vaginam, os uteri will be found hot and sensitive; sometimes discoloration is seen on examination per vaginam.

Treatment.—Explore vagina if possible and ascertain if fœtal membranes are away; there may be some shreds left which may be putrefying in the womb. If so, wash out with a reliable disinfectant and antiseptic, give a mild laxative with anodynes, and apply hot water blankets round the abdomen, and see to the general comfort of the animal. If we fear the metritis is of a septic origin, try the administration of internal antiseptics and stimulants with nutritious diet, and thorough irrigation of the uterus and vagina every day at least with suitable antiseptic solution. Some

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recommend packing the womb, but I have never resorted to this in cattle practice.

POLYPUS IN THE VAGINA.

These are frequent in the cow, attached to the mucous membrane a little distant from the orifice; the shape is generally that of a pear. I removed one weighing 4¼ lbs. from the vagina of a cow lately by ligature and excision, and used a simple antiseptic dressing for a few days; the cow did all right.

PARTURITION.

Now, gentlemen, I just wish to say a few words in regard to parturition in the cow. As a rule the messenger that comes for us in these cases is sweating and out of breath, and will gasp out that Mr. So-and-so wants you to come to a cow that can't calve. After asking a few questions we pack up a few necessary instruments, ropes, and the usual paraphernalia, and proceed with all speed to the scene of action. When we arrive there, and begin to explore the case, we generally find that Mr. Handyman has been there before us, and has spoiled the case and left it, because he could not do it. There are just a few positions that I wish to say a few words about. (1.) Breech presentation. (2.) One fore and one hind limb. (3.) Two fore limbs with head away back. (4.) Twist of neck of womb.

In breech presentation, push back buttocks of calf right as far up and back as you can, then get hold of foot and turn sideways and upwards, and you will get it into passage quite easily. Do likewise with other foot and the calf generally comes away quite easily.

In one fore and one hind you require to be able to judge which way the fœtus will come away easiest. Generally to push back the fore limb is safe practice, as by doing so you have no trouble to look for the head. Then get up the other hind limb and the fœtus comes away with little trouble.

In the case with the two fore legs with the head back, the position is generally the result of long-continued straining of the cow without delivery. If the head cannot be searched by the hand try a blunt hook, and if unsuccessful then try and remove one fore limb, which is sometimes a very difficult job. You should then be able to reach head and get fœtus away. Then as regards twist or torsion of the womb, this generally involves the cow to be thrown and rotated from one side to the other until the twist is undone, and then delivery is usually easily enough accomplished. Some veterinary surgeons recommend jamming fœtus in passages and take it away that way. After-treatment is anodynes if necessary and fomentations if needful.

PARTURIENT APOPLEXY.

This disease used to be very fatal in the cow until Herr Schmidt, of Kolding, found out the pot. iod. treatment. There are a good many theories put forward as to the cause, such as clean milking immediately after calving; by ptomaines, the products of decomposition of food in the stomachs and intestines (but I look upon this as the result, not the cause of the disease); by anæmia of the brain; and by auto-intoxication. I favour this view and believe milk fever is due to some toxic material that gains entrance or is manufactured in the animal economy and thus gaining access to the blood-stream. It may be due to some bacillus, but for that I can't say. By some it is supposed to arise from the liver not being able to

cope with the waste products in the blood during the time of rapidly rising lactation, especially as the liver and in fact all the glands in the animal economy have been in a state of comparative quiescence during the dry period—the light food the animal gets when dry is suddenly altered to stimulating food—and this condition may give rise to the auto-intoxication that produces the symptoms that we all so well know, and the eight principal symptoms have been put before you when contrasting them with puerperal eclampsia, so I will go on to the treatment and sequelæ. This much then can be said of milk fever, that it may be considered a genuine auto-intoxication caused by the accumulation or manufacture in the system of toxic material during the first stages of lactation. This circulating through the blood causes the symptoms of poisoning of the whole system of the animal. In relation to this theory I would point out that only good milkers are attacked, and that those which have been dry for some time are more liable, especially those that have been fed on rich food when dry, and cows that are hardly ever outside the byre. These sort of cattle, after an easy calving, go at the milking in a hurry (as we may say), and arrive at the height of lactation very quickly, and in this way the intoxication occurs, owing to the over-burdening of the liver and kidneys with work. Just as when the air we breathe is polluted with a certain amount of Co_2 we show the effects of Co_2 poisoning, so, when the toxic material gets to a certain percentage in the blood of the cow she shows the symptoms of poisoning. Of the percentage that it takes I can't say, but this is the theory I hold in regard to milk fever, and upon this I base my treatment, and whether it is a a product of casein, neuclein, albumen, or what, I am not prepared to say. Clearly it is the province of our scientists to elucidate such problems, for the general practitioners have neither time, money, nor appliances to do so.

Treatment.—I have tried a lot of remedies in milk fever; I have tried the following injections into the udder and they have proved fairly efficacious.

℞ Chinosol from 40 to 60 grs., according to size and weight of cow; boiled water 2 quarts.

And after milking the cow, clean and disinfect the udder and teats, when about the blood-heat I inject one-fourth into each teat. I also give the following every three hours alternately if the cow can swallow, and if in a weak state I give 4 oz. spt. ammon. arom. in 1 pint cold water, and if she can't I inject with the stomach pump.

℞	Liq. ammon. acet. conc. (1 in 7)	℥ii.
	Spt. ether nitrosa	℥ii.
	Aqua	℥xii.

Then ℞ Whiskey ℥iij., or spt. ammon. arom. ℥iij.
Aqua ℥xii.

I sometimes use the following injection, which is also very good:

℞	Iodine resub.	grs. iv.
	Pot. iodide	4 to 5 drs.
	Boiled water	2 qts.

To be used as the foregoing. The drenching part of the treatment must be done with great care.

The sequelæ are: mechanical bronchitis from regurgitation of the food, mammitis, metro-peritonitis, from giving drastic purgatives; pneumonia, bruised knees and hocks, fatty degeneration of the muscles of the thighs from bruises, paralysis, choking at drenching. If a cow has tuberculosis in

a latent form and takes milk fever she is sure to die. I sometimes empty rectum and bladder, and this sometimes gives the animal relief; I also sheet up the animal well, as there is a tendency to a sub-normal temperature. I have tried stimulating embrocations along the spine when the cow was long in getting up, and when symptoms of paralysis are shown I prescribe doses of nux vomica. A great deal of success lies in the manner in which the cow is nursed. I give the attendants orders to turn the animal every four hours or so, but sometimes they neglect to do this very necessary part of the treatment, with the result that the cows gets knees, hocks, &c. bruised, and then when she wants to rise she can't because of the sores and bruised condition of the muscles. There has been more success in the treatment of this disease in late years than before.

Now, gentlemen, I think I have taken up your time sufficiently, and I will come to a conclusion by saying that the lot of a country veterinary surgeon has its bright side as well as its dark side. He generally gets his clothes more soiled and is generally not so stylishly got up as his city brother; we have as a rule more dirty work and smaller pay for it, and we must appear in harmony with our work.

I beg to thank you all for your patient hearing, and I trust that my effort will be rewarded by the members all participating in a good discussion.

PURCHASE AND CHARGE OF HORSES AND MULES IN AMERICA.

HORSES and mules for the British are consigned to Major J. Moore, the British commandant at Lathrop, and all shipments to South Africa are billed to the English agent at Cape Town.

Guyton & Harrington have an exclusive five-year contract, dating from May 9, 1901, by which they are to supply the British Government with all remounts which it may need, and under this same contract the British pay 35 cents a day for each horse and mule for feed, with an additional stipulation that they shall keep at Lathrop at all times an average of 5000 animals.

Guyton & Harrington admit the contract, both for the supply of remounts and the feeding; but they assert with vehemence, and the Clinton County records bear them out, that all of the property under their control is theirs by title in fee-simple or *bona fide* lease. They strenuously deny that the British Government has one dollar's investment within their knowledge at Lathrop.

Twenty-one Sepoys, muleteers in the English Army in India, are camped on the Guyton & Harrington property, about a mile north-east of Lathrop. They are here to take to India a shipload of small mules. They are in charge of Captain Gough. Photographers are not allowed within rifle range of the natives, much less Kodak distance. They wear the East Indian costume—a loose shirt reaching to the knees, baggy blue pantaloons, and yellow cloth turbans, with gorgeous red plumes. The camp attracts a great deal of attention.

That the inspection, vaccination, branding and shipping of horses and mules at Lathrop is under British auspices aud direction is beyond question. Governor Dockery's private secretary, after investigation, made this report to the Governor, and the report has been forwarded to Washington. Even

though the British may not own a dollar's worth of property, they could not be in more absolute charge or have more conveniences or comforts at their command.

In support of the impression that this is a British supply depôt is the following extract from an article written by Major Moore for publication in a souvenir recently issued by the proud citizens of Lathrop for general distribution. Inasmuch as it bears the major's signature and was written before the present trouble developed, it may be accepted as a semi-official if not official statement of facts :—

"It's an ill wind that blows nobody good." The Boer war has caused a market for horses and mules in many parts of the world. In the United States of America in South America, Hungary, Spain, Canada, Australia, England, Scotland, Ireland, and elsewhere, officers of the Remount Department of the British Army are hard at work purchasing and despatching to South Africa as requirements necessitate.

The Commission in the United States is the largest of all, and accounts for about 7000 animals monthly. The head of the Commission is Colonel Ulick de Burgh, of the Army Remount Department, War Office, London, who has his centre in Kansas City, Mo. With him are associated Colonel Skinner as finance officer, several purchasing officers, officers in charge of embarkation at New Orleans, veterinary surgeons, &c.

The little town of Lathrop, Mo., is closely connected with the Commission, inasmuch as all horses and mules are there collected previous to despatch to New Orleans for embarkation.

The efficiency of a mounted army corps greatly depends on the health of its horses, and the British authorities are desirous of admitting into South Africa such animals as are physically fit and free from contagious diseases, which cause destruction, loss, and inconvenience while on active service. For the purpose of closely examining, testing, sorting, and feeding previous to shipment it was decided to have a locality up country, and not at the point of shipment, viz., New Orleans, where want of space and an insanitary district militated against the successful landing of horses in South Africa.

Missouri was well known to be a great stock-producing State, well watered, well fenced, and in every way suitable for the corraling, grazing, feeding, and manipulating large numbers of horses. Through the association of Messrs. Guyton & Harrington Lathrop was selected, and arrangements made with that firm. That they have responded well to the wishes of the British Remount Commission is seen in the extensive barns, corrals, hospitals, chutes, elevators, &c. which they have erected, and the acres upon acres of land which have been purchased and leased by them, and which on the close of the British Remount Commission will be used for their own extensive business. It would be difficult to imagine a more perfect place for the handling of stock as that now in use by Major Moore and his staff at Lathrop—every necessity, every convenience, and for reasons that are very evident scrupulously clean and sanitary. The barns remind one of a Begum's palace in the East, and the box stalls are revelations of luxury to the bronchos of the West. They represent the daily toil of many hands and minds for several months—the well-sinker, the stone mason, the lumber-man, the carpenter, the engineer, the railway company, and last but not least, the man who has to pay for all. The work is still progressing, and in time Lathrop will be known among the largest stock markets in the world. All prosperity to it!

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Since the 9th of May—the day on which the arrangements between Messrs. Guyton & Harrington and the British Government commenced, and up to the end of the year 1901—47,939 animals, viz., 39,668 horses, and 8271 mules, belonging to the British Government, have passed through Lathrop. On an average 5000 are on hand. The largest number ever present was 8127 on July 1; largest number of animals moved to or from pasture in one day was 3500; largest number received by rail, one day was 72 car loads, the different trains arriving at the station about the same time. Animals were sent to New Orleans by special trains of about 23 cars (500 animals) each, accompanied by some one in charge.

On arrival at Lathrop the animals are taken to different pastures, where they await their turn for testing, and afterward their turn for shipment to South Africa, as their condition indicates. They are usually from a fortnight to three weeks at Lathrop. During the summer 4800 acres of pasture were in use. Now Messrs. Guyton & Harrington have about 7000 acres, some their own property, the rest leased. All the pastures are well watered; numerous wells have been sunk, windmills erected, springs opened, and the water is the purest and best obtainable in any country. Each pasture is well supplied with large, strong, feed troughs, capable of accommodating twenty-five animals each, and racks constructed so that they can be moved from place to place when fresh and clean ground is considered necessary. Altogether there are nearly 300 feed troughs.

War invariably has in its train some contagious disease among horses and transport animals. Glanders is the most frequent. To guard against introducing this disease into South Africa the British Government employs the mallein test in all animals purchased. By causing a reaction or particular disturbance in the system of a glandered animal this agent determines the diseased from the healthy. The test is very simple, and the value of being able to pick out an animal with the disease in its initial stage or latent form, and long before there are any dangerous signs presented, can be well understood.

To control all these operations—the mallein test, supervision in pastures, receiving and dispatching by rail, &c.—the British Government has in its employ ten officers and about twenty-four men. Major Moore, acting under orders from Colonel de Burgh, is in command at Lathrop, and with him are associated Messrs. Barrowman, Trydell, Wall, Uber, Bassier, Patterson, M'Lean, Captain Gray and Lieutenant Thompson. Andrew Caldwell is Major Moore's foreman.

It will be noticed that the Major's statement covers the receiving and dispatching of horses and mules as well as the inspection, and that at all times they are under British supervision. Further, it would appear that Messrs. Guyton & Harrington, before signing the five-year contract, agreed to build barns and to meet the wishes of the British Government.

This innocent statement of facts by the Major caused no comment until the Congressional resolution demanding an investigation, and then an attorney for Guyton & Harrington made haste to gather up all of the souvenirs he could find in Lathrop.

Major Moore declines to talk for publication. He avers he is here as a private citizen, although in the service of the British Government, and that the duties of himself and fellow-officers are to inspect the horses and mules and treat them before shipment to South Africa, where they are sold to the British Government.

One of the principal officers in Kansas City was a little more communicative. "Not one single foot of land and not one dollar's worth of property is owned by the British Government at Lathrop," said he. "All this agitation is about nothing at all. I cannot see why we may not buy horses and mules in Missouri without charges being made that the Government is violating the neutrality laws. The British Government, you may rest assured, has not violated the law and will not."

Charles D. Nicoll, vice-president of the Guyton & Harrington Mule Company, said :—"There is no cause for any talk or for any Congressional action. Our company owns a farm of 5000 acres near Lathrop, and we have owned it since 1892. We operated it before the Boer war began, and we expect to do so after it ends. Of course the South African war has given stimulus to our business, and we have handled a large number of horses and mules for the British Government, but the horse and mule market was good before the war and will be after it closes. In addition to the big farm, which our firm owns outright, we have leased several farms adjoining, about 2400 acres in all, which we were not able to buy at satisfactory prices. We have not made any improvements on the leased land. All our stables, granaries, &c., are on our own land. The only thing we have built on our farms as a direct result of the increased business with the British War Office is three inoculation stations and chutes, which were justified as an accommodation for so large a buyer."

The legal decision under which the British felt perfectly free to proceed openly with their purchasers and shipments of horses and mules to South Africa was handed down by Judge Parlange in the United States Circuit Court at New Orleans, April 13, 1901.

Judge Parlange held that the transactions between citizens of the United States and the British Government were conducted under the order of private citizenship and that the courts had absolutely no jurisdiction to interfere. The horses and mules, the court said, were bought in a neutral territory. Judge Parlange continued : "If the complainants could be heard to assert that rights personal to themselves in the treaty are involved, and if the mules and horses involved in this same are munitions of war, all of which is disputed by the defendants, it would become necessary to determine whether the United States intended by the declaration of treaty (Washington, May 8, 1871) to subvert the well-established principle of international law that the private citizens of a neutral nation can lawfully sell supplies to belligerents.

"It is almost impossible to suppose *a priori* that the United States would have done so and would have provided for the most serious and extensive derangement of and injury to the commerce of our citizens, whenever two or more foreign nations should go to war ; and it would seem that there is nothing in the treaty, especially when its history and purposes are considered, which would warrant the belief that the United States insisted upon inserting therein a new principle of international law from which the greatest damage might result to the commerce of this country, and which was absolutely different from and antagonistic to the rule and policy which the Government of this country has hitherto strenuously and invariably followed.

"The principle that neutral citizens may lawfully sell to belligerents has long since been settled in this country by the highest judicial authority."—(*The Brooklyn Daily Eagle*, 27th April 1902.)

THE SALE OF TUBERCULOUS CATTLE.

MAGISTRATES ADVOCATE THE NEED FOR LEGISLATION.

An important case affecting the sale of tuberculous cattle at public auctions was heard by Colonel Lascelles and other magistrates at the Eddisbury (Cheshire) Petty Sessions, on May 26th. It was a case in which Alfonso Garcey, farm labourer, of Huxley, near Chester, was summoned for ill-treating a cow on May 5th and 6th, whilst his employer, James Oultram, farmer, of Huxley, was summoned for causing the offence. Inspector Blake Jones prosecuted on behalf of the R.S.P.C.A.

From the evidence it appeared that on May 5th Oultram purchased a cow for 12s. 6d. at the Beeston Smithfield. It was in the last stages of tuberculosis, and was intended for the hounds. Garcey was instructed to drive it to Huxley, a distance of three miles, and he proceeded to do so. He had barely gone 300 yards, however, when the animal fell, owing to exhaustion. The boy thrashed it to urge it along, but it was of no avail. A police officer advised Oultram to get a float to take it home, and he promised to do so; but later on in the day, on two occasions, the officer saw the animal on the road. Its side was covered with bruises, caused by ill-treatment. Oultram left the cow in the road. Some people in the vicinity afterwards put it in a croft close by. The next morning the boy Garcey came for it, and started driving it home again. Eventually it fell into the ditch, and had to be slaughtered.

The Chairman.—Is there no restriction at these markets? Inspector Jones replied that animals suffering from tuberculosis did not come under the Contagious Diseases Act. Animals were taken to the markets in various stages of tuberculosis. It was a discreditable thing that people should send such beasts to public auction. The Chairman said the responsibility rested upon Oultram, who would be fined 40s. and costs. The case against Garcey would be dismissed. The Chairman added that if the magistrates could do anything to prevent the buying or selling of such cattle at auctions they would do it, and should take what steps they could in the future to prevent it. The bench intended making a representation to the Board of Agriculture on the subject, in the hope that it would lead to some legislation on the matter.

(*Meat Trades Journal*, 5th June 1902.)

LOUPIN'-ILL IN SHEEP.

Professor Hamilton, of Aberdeen University, has, after lengthened investigation, discovered the bacilli of loupin'-ill in sheep, a disease which derives its name from the fact that it causes the sheep to spring up in walking. The Professor announced to his class the other day that he had at last found and identified the germ which caused the disease. Professor Hamilton is chairman of the committee which is engaged in the investigation of braxy in sheep, and he is also conducting important experiments with regard to bovine tuberculosis and anthrax.

(*Meat Trades Journal*, 5th June 1902.)

THE INTERCOMMUNICABILITY OF HUMAN AND BOVINE TUBERCULOSIS.[1]

BY MAZŸCK P. RAVENEL, M.D., BACTERIOLOGIST OF THE STATE LIVE-STOCK SANITARY BOARD OF PENNSYLVANIA.

From the Laboratory of the State Live-stock Sanitary Board of Pennsylvania.

I FIND it difficult to express adequately my deep sense of the honour which has been paid me by the invitation of your committee to give the address of the evening on this occasion. The Pathological Society of Philadelphia has from its foundation had a most honourable position among the scientific bodies of the world, and has always stood for what is best and most advanced in the branch of medical knowledge to which it is particularly devoted. I have always felt it a high privilege to be able to inscribe myself a member and to have the seal of the Society put to such contributions as I have been able to make. More than this I never thought of aspiring to, hence the invitation to give this address was as unexpected as it was grateful to me.

The hesitation which I naturally felt over accepting such a responsible office was relieved, to a considerable extent, by the suggestion of your committee that I should speak on some phase of the tuberculosis problem, which has been an object of special study at the Laboratory of the State Live-stock Sanitary Board of Pennsylvania, and in which I have had the constant advice and assistance of Dr. Leonard Pearson, State Veterinarian of Pennsylvania, and Dr. S. H. Gilliland, First Assistant. The work I am about to report from our laboratory is the result of our joint efforts, and I take pleasure in acknowledging my personal indebtedness to these co-workers.

The past decade has seen the awakening of a wide-spread interest in the study of tuberculosis, the spirit of Oriental fatalism which has for so long led us to view with equanimity the awful loss of life annually inflicted by this great white plague having given way to an active campaign against its ravages, a campaign so far largely one of education, in which we strive to spread far and wide the fundamental facts that tuberculosis is a communicable disease, and, from that fact, preventible. If preventible, why not prevented? With these precepts firmly implanted in the minds of the medical profession, as well as of the general public, we have reason to hope that each year will see a more careful study of the methods by which tuberculosis is spread and the means to be adopted for its prevention. On every hand societies for the prevention of tuberculosis are being formed, whose object is to teach the truth concerning the disease and to dispel those false notions, chief among which may be mentioned belief in the hereditary character of tuberculosis, which in the past have led us to regard the tribute of human life as inevitable.

The intelligent prophylaxis against any disease demands a thorough understanding of the methods by which it is spread. The whole world is in accord in assigning the chief rôle in the propagation of tuberculosis to the inhalation of particles of sputum thrown off by phthisical persons, the majority of the profession agreeing with Cornet in the belief that sputum is most dangerous when dried and pulverised, while others follow Flügge in

[1] An address delivered at the Annual Conversational Meeting of the Pathological Society of Philadelphia, on Thursday evening, April 24, 1902.

regarding the moist floating particles thrown out during coughing, sneezing, &c., as most to be feared. The danger to mankind from tuberculosis of cattle has been discussed at a length and with a fervour not surpassed in the history of modern medicine. The immense practical importance of the subject to the medical profession, to those charged with making and enforcing laws for the preservation of the health of the community, no less than to every man, woman, and child, justifies our deepest interest, and most earnest studies.

The relation that exists between human and bovine tuberculosis, and the part played by cattle in spreading the disease among mankind is now the great question, to which attention has been drawn with renewed activity by the attitude of Professor Koch, announced in his paper before the British Congress on Tuberculosis, in July 1901. This paper was the more striking in that it contained statements diametrically opposed to the former teaching of Koch that "Bovine tuberculosis is identical with human tuberculosis, and is thus a disease transmissible to man."[1] This belief was the outcome of the experiments made by Koch at the time of his discovery of the tubercle bacillus, and has been generally accepted by the medical and veterinary professions up to the present time. So much has been written of late on the subject that I will pass over minor differences of opinion and at once take up the consideration of the two main propositions which were formulated by Koch, and which include all points of controversy in the discussion of the relation between human and bovine tuberculosis.

1. "Human tuberculosis differs from bovine and cannot be transmitted to cattle."

2. "Though the important question whether man is susceptible to bovine tuberculosis at all is not yet absolutely decided, and will not admit of absolute decision to-day or to-morrow, one is, nevertheless, already at liberty to say that if such a susceptibility really exists the infection of human beings is but a very rare occurrence. I should estimate the extent of infection by the milk and flesh of tuberculous cattle, and the butter made of this milk, is hardly greater than that of hereditary transmission, and, therefore, do not deem it advisable to take any measures against it."

I. The first of these propositions is susceptible of direct experimental investigation, and can, therefore, be answered positively without going into the domain of theory. Professor Koch based this statement on the result of an insufficient number of experiments done by Professor Shütz and himself. A number of young cattle proved to be free from tuberculosis by the tuberculin test were infected in various ways with the bacilli of human origin or with tubercular sputum. "In some cases the tubercle bacilli or the sputum were injected under the skin, in others into the peritoneal cavity, in others into the jugular vein. Six animals were fed with tubercular sputum almost daily for seven or eight months; four repeatedly inhaled great quantities of bacilli, which were distributed in water and scattered with it in the form of spray. None of these cattle (there were nineteen of them) showed any symptoms of disease, and they gained considerably in weight." After six to eight months they were killed, and no trace of disease was found in the internal organs. Where the injections were made small foci of suppuration had formed in which there were found a few bacilli.

Inoculations of a similar nature with bacilli from the lungs of an animal with bovine tuberculosis resulted always in rapid illness, ending often in

death, while some were killed in a miserably sick condition after three months. In all cases there was extensive tuberculosis, involving the internal organs, especially the lungs and spleen.

A similar difference in pathogenic power was found in feeding experiments on pigs, where one lot of six received human tubercular sputum, and a second lot of six were given pure cultures of the bovine tubercle bacillus; and also in experiments on asses, sheep, and goats, where the inoculations were made with pure cultures of human and bovine bacilli into the circulation.

Results similar to these in the main have been obtained by Smith,[2] Frothingham, Dinwiddie,[3] and at the laboratory of the State Live-Stock Sanitary Board of Pennsylvania,[4] and we may admit that, as a rule, cattle show a high degree of resistance to the human tubercle bacillus, and that for all experimental animals the bovine bacillus has a pathogenic power equal to the human bacillus, while for the great majority it is vastly more pathogenic; but this does not by any means show that man is not susceptible to infection by the bovine organism, and we have abundant proof that it is quite possible to infect cattle with the tubercle bacillus from human sources.

The identity of tuberculosis as seen in man and in cattle was held by Villemin, who believed he had proved the correctness of this view in his inoculation experiments, by which he showed conclusively that small animals like rabbits became tuberculous following the injection of material from man as well as cattle. Chauveau[5] was, however, the first to make the attempt to infect cattle with tubercular material from man, and his success is shown in the following abstract of his experiments:—

First Series.—*Infection by the Digestive Tract.*—Three animals were used, and as controls there were three other similar animals which were infected with bovine material, and also three which were not infected at all, these last remaining free from tuberculosis. Those to which bovine material had been fed as well as those which received human material became tuberculous. At the autopsy it was impossible to distinguish one set from the other. In all of them the lesions provoked showed the same character. The individual histories of the three animals infected with human material are as follows:—

1. A heifer, six months old, which received material from the lung of a young man dead of acute miliary tuberculosis. Two doses of an emulsion of this material were given morning and evening of the same day. It was killed on the fifty-seventh day, having lost flesh to a slight degree. The lesions were found almost exclusively in the abdominal cavity. In the small intestine there were more than two hundred tubercles varying from the size of a pea to that of the head of a pin. The liver contained upward of a dozen small tubercular masses on its surface. The peritoneum showed a marked eruption of tubercles.

2. A heifer, eleven months old, which received two feedings with an interval of two days, the material being taken in part from the lung of a child with acute miliary tuberculosis and in part from the lung of an adult with a marked chronic phthisis with caseation. The animal soon became sick, and during life tuberculosis could be detected. The submaxillary ganglion on the right side became enlarged about the fifteenth day, and increased steadily until the animal was killed on the fifty-ninth day. The intestinal tract was only slightly involved, but the ganglia related to the

first portion of the digestive tract showed marked lesions. The right submaxillary and the retropharyngeal glands were considerably enlarged, and showed a typical tuberculosis with some calcification. The principal lesions were found in the thoracic cavity. In the lung were a dozen disseminated foci, mostly superficial, most of which showed caseous points on section. Microscopical examination showed them to be made up of a great quantity of lymphoid cells, with some giant cells. In the neighbourhood of these masses, and also in areas far from them, were found diffuse tubercles developing in the alveolar tissue, as well as in the perivascular and peribronchial connective tissue. These young lesions showed exactly the same histological structure as the larger ones. The bronchial and mediastinal glands were also markedly involved.

3. A young bull, about ten months old, which received two feedings on two consecutive days, composed of an emulsion made from the lung of two persons who had died of chronic phthisis (caseous pneumonia). After a diarrhœa which lasted several days the animal showed marked illness, and lost flesh. It soon began to cough, and so marked were the symptoms that it was slaughtered on the thirty-fourth day. In the small intestine there was a marked eruption of tubercles extending from about the second portion of the jejunum to the end of the ileum. In certain portions the mucous membrane was converted into confluent tubercles. The most interesting lesions were found on the mucous membrane of the respiratory tract. In the larynx and the upper part of the trachea were found masses of grey granulations, a few of which were red and ulcerated.

SECOND SERIES.—*Infection by Intravenous Injection.*—A calf, three months old, was inoculated into the jugular vein with 2 c.c. of an emulsion made from the lung of a child with acute miliary tuberculosis. It was killed on the twenty-ninth day. The lesions were confined to the chest, the bronchial and mediastinal ganglia showing the most marked changes. In the lung, on section, there were found well-marked grey granulations accumulated in the interior or around the small bronchi, which they sometimes occluded entirely. This was well seen with the naked eye, but was better demonstrated in microscopical sections.

THIRD SERIES.—*Infection by Subcutaneous Injection.*—Seven animals were inoculated. For three animals the material used was obtained from fungus masses from the joints in cases of white swelling; for three others from acute miliary tuberculosis, and in one from the lung of a horse which had developed a marked pulmonary tuberculosis due to the intravenous injection of material from the lung of a man. In all cases a tumour developed at the point of inoculation, which Chauveau describes as being a tuberculous tumour altogether typical. The neighbouring glands showed always more or less involvement, but in no case was there any general infection.

I have quoted these experiments at some length for the reason that they seem often to be overlooked, and for the further reason that they have recently been directly misquoted. Indeed, Koch himself said in his address before the British Congress on Tuberculosis, "If one studies the older literature of the subject, and collects the reports of the numerous experiments that were made in former times by Chauveau, Gunther and Harms, Bollinger, and others, who fed calves, swine, and goats with tubercular material, one finds that the animals that were fed with the milk and pieces of the lungs of tubercular cattle always fell ill of tuberculosis, whereas those that received human material with their food did not."

Bollinger,[6] in 1879, inoculated a young calf in the peritoneal cavity with material from a human lung. When killed after seven months the mesentery and peritoneal covering of the spleen presented a number of tumours from the size of a pea to that of a walnut, and which microscopically were identical with those found in pearly disease under natural conditions. The retroperitoneal and mesenteric glands were tuberculous also.

Klebs[7] caused a tuberculosis of the peritoneum identical with what is seen under natural conditions by the intraperitoneal injection of human tubercular material. Kitt,[8] also, is quoted by Professor Johne as having had a similar result accompanied with generalised lesions following the intraperitoneal injection of the juice from a scrofulous gland taken from the neck of a man.

Crookshank[9] injected tuberculous sputum into the peritoneal cavity of a calf, causing death on the forty-second day. The autopsy revealed extensive disease. "Extending over the mesentery from the point (inoculation) there were hundreds of wart-like, fleshy new growths, some quite irregular in form, others spherical or button-shaped. There were similar deposits on the under surface of the liver, on the spleen, in the gastrosplenic omentum, and on the peritoneal surface of the diaphragm. On microscopical examination extremely minute tubercles were found disseminated throughout the lungs and liver. Tubercle bacilli were found in these organs and in the peritoneal deposits."

Sydney Martin[10] fed human tuberculous sputum to six calves. Four of these received each 70 c.c. mixed with their food at one meal. They were killed after thirty-three, sixty-three, eighty-five, and two hundred and eighty-five days. The first three showed respectively fifty-three, sixty-three, and thirteen tubercular nodules in the intestine, while the fourth was entirely free. The two other calves were given 440 c.c. of sputum at one feeding. One was killed after fifty-six days, and showed tuberculosis of the intestine and mesenteric gland. The other was allowed to live one hundred and thirty-eight days, and was free from disease when killed.

At the recent Congress on Tuberculosis, Professor Thomassen,[11] of Utrecht, reported the following experiment: A calf, four weeks old, was inoculated in the anterior chamber of the eye with a pure culture of the tubercle bacillus isolated from a case of tuberculous arthritis in man. An intense keratitis was set up, the cornea becoming so opaque that it was impossible to observe the alterations in the iris. It was killed after six weeks, and was found to be the victim of a pretty well generalised tuberculosis. Both lungs contained numerous miliary tubercles and some grey fibrous tubercles of larger size. The path of infection from the eye to the lung was mapped out by the condition of the subparotideal, cervical, mediastinal, and bronchial lymph glands of the same side.

Nocard[12] states that by inoculation into the arachnoid cavity of a small amount of human tubercle bacilli a rapidly fatal tubercular meningitis is set up identical with that seen in children. A calf, five months old, was thus inoculated by him on August 2, 1901, and died on the 28th of the same month, the pia mater being infiltrated with tubercles which proved virulent for guinea-pigs.

On the same day Nocard injected into the jugular of a cow which had become much reduced by chronic diarrhœa, but which was free from tuberculosis as shown by the tuberculin test, 1 c.c. of a suspension of human bacilli. She died September 4th, and showed a number of small foci,

softened or caseous and extremely rich in tubercle bacilli. He considers that in this case the animal was so weakened by the pre-existing diarrhœa that its normal resistance was largely destroyed.

De Jong,[13] as the result of a series of comparative inoculations of human and bovine tubercle bacilli, states that seven cattle, namely, two calves six months old, three steers two years old and one eighteen months, and one calf seven or eight months old, all became tuberculous by the injection of pure cultures of the human tubercle bacillus. In only one of the seven was the disease grave and widespread ; in four the lesions were retrogressive, and in the two remaining ones progressive.

Arloing [14] reports the following recent experiments: Three cultures of human origin were used, one of which had been under cultivation since 1896. With this culture a heifer, two years old, and a young calf were inoculated intravenously. The calf was killed after thirty-two days, and showed a typical eruption of minute tubercles all through both lungs, but especially marked in the anterior lobes. The heifer was kept for one hundred and twenty days, and was only slightly diseased, the lungs and pleuræ being involved. With the second culture, obtained from a case of pleurisy, a calf two and one-half months old was inoculated intravenously. Death ensued after seventeen days. The lungs alone were involved, showing many young nodules. The third culture was isolated from a case of pleuropericarditis, with involvment of the lungs, and with this a young bull convalescent from aphthous fever was inoculated intravenously, death resulting in thirty-two days. The thoracic cavity was principally involved, the anterior and middle lobes containing nodules throughout, and some lobules of the posterior lobes also. The bronchial and œsophageal glands were tremendously enlarged, weighing thirty-five kilogrammes.

It may be objected to many of these experiments that the tuberculosis resulting from the inoculation did not cause death nor even serious illness, and it is probable that some of the animals would have recovered entirely if allowed to live. Admitting freely the truth of this, it may be pointed out that under natural conditions many cattle infected with bovine tuberculosis will remain for years apparently in perfect health, so much so that detection of the disease is possible only by means of tuberculin. So, also, in man, many cases of tuberculosis run a benign course, or remain stationary for years, while not a few end in recovery. Yet, in man and in animals these benign cases may take on an acute form and end in rapid death, owing to some intercurrent affection which lowers resistance or permits the engrafting of a secondary infection. No one would hold that because of the benign course of the disease in the first instance that true tuberculosis did not exist.

Transmission of tuberculosis to cattle from phthisical attendants.—There are on record a few instances of cattle becoming infected with tuberculosis through the sputum of phthisical attendants. In several of these the evidence is so clear as to leave no doubt that cattle are at times infected in this manner. Such instances have been reported by Cozette,[15] Cliquet,[16] Huon,[17] Director of the Vaccine Laboratory at Marseilles, and Bang.[18] In most of these cases the sputum was introduced into the digestive tract with the forage, as well as inhaled in the dry state, but in Huon's animal the infection seems to have been entirely through inhalation.

Experiments at the Laboratory of the State Live-Stock Sanitary Board.—I come now to speak of the work done at the laboratory of the State Live-Stock Sanitary Board, the results of which you see illustrated in the speci-

mens presented here for your inspection and study. I cannot but feel that these specimens possess an unusual interest and importance in the solution of a problem which is now engaging the attention of scientific men throughout the world, and which has been made the subject of special investigation by the Governments of many countries. Our first successful attempt to infect cattle with human tuberculosis was made in 1898, when four calves of nearly the same age, four to five weeks old, received intraperitoneally 10 c.c. of human tuberculous sputum, from different sources, but in all cases containing a large number of bacilli. One showed no ill effects except a slight rise in temperature, and the autopsy was entirely negative.

Of the other three, two had persistent high temperature following the injection, but only one showed marked illness otherwise. Post-mortem examination proved that all had become infected with tuberculosis, the lesions in two being quite extensive. I will give here the details of only the one which showed marked illness during life. The lesions were so extensive and typical that even the most sceptical must admit the success of the experiment, and I have here some of the organs for inspection.

Calf No. 8050, aged four weeks, was inoculated on May 16th, 1898, with sputum from an early case of pulmonary tuberculosis at the University Hospital. The sputum contained a large number of tubercle bacilli. Soon after the operation the temperature of the calf rose and continued high, with some remissions, until it was killed. Its appearance was bad, the coat dry and rough, the respiration rapid. It was tested with tuberculin, but the temperature was too high for results. It was killed on August 1st, weighing one hundred and ninety pounds. On the surface of both lungs there was a slight deposit of fibrin, and on section a number of hæmorrhagic areas were observed in both. The mediastinal and bronchial glands were enlarged and congested. The abdominal cavity contained about twelve ounces of bloody serum. The peritoneum was thickly studded over its entire surface with nodules from 1 mm. to 12 mm. in diameter, fibrous in character. In many places these nodules had massed together, forming tumours, some 5 cm. in diameter, which were dense and fibrous. The spleen contained many nodules, both on its surface and throughout its substance. The whole omentum was thickly studded with nodules from 2 mm. to 12 mm. in diameter, and besides which there were three large masses, dense and fibrous in character, two of which were 15 cm. long by 7 cm. wide, and 12 mm. thick; and the third 7 cm. long by 6 cm. wide, by 4 cm. thick. The abdominal surface of the diaphragm was thickly studded with nodules, fibrous in character. The mesentery was thickened, and contained many nodules of small size. The appearance was that of a typical case of grape or pearl disease. The mesenteric and mediastinal glands were enlarged and somewhat caseous.

For several years past we have endeavoured to obtain material from cases of tuberculosis in children in which there was evidence of infection through the alimentary tract, reasoning that if children contracted tuberculosis through the ingestion of milk from diseased cattle we would be most apt to find bacilli of the bovine type in these intestinal or mesenteric lesions. So far only three such cases have come to us, all through the kindly interest of Dr. Alfred Hand, and in only one of these was the evidence of primary intestinal infection clear. We have isolated from the mesenteric gland of this child, the immediate cause of whose death was tubercular meningitis, a culture which has for cattle the most intense

pathogenic power. Two calves inoculated into the jugular vein and peritoneal cavity died in nineteen and twenty-seven days respectively; and a grown cow which was inoculated both in the jugular vein and peritoneal cavity died in eighteen days. All of these animals exhibited marked symptoms from the day of inoculation. Examination of the lesions, both macroscopical and microscopical, leaves no doubt that the animals succumbed to a pure tuberculosis. The details of these cases are as follows:—

History of culture.—Designation BB. Obtained from a child seventeen months old. Death was due to tubercular meningitis. Autopsy: Lungs normal, except posterior part of right upper lobe, which was consolidated, red on section, and had excess of connective tissue. Bronchial and mediastinal glands not enlarged. Spleen, liver, and kidneys show pearly tubercles. Two feet from lower end of ileum is an ulcer 1 cm. by 2 cm., the long diameter transverse to axis of gut. Nodules are seen on peritoneal surface. Four small ulcers, two above and two below, are found in ileum. Mesenteric glands enlarged, cheesy, and some purulent. Meninges show yellow tubercles most marked along longitudinal fissure, in choroid plexus, and over cerebellum. The mesenteric glands were used in obtaining the culture.

This case is considered by Dr. Hand the clearest one of primary intestinal tuberculosis ever seen by him.

Guinea-pigs were inoculated intraperitoneally with an emulsion made from the mesenteric glands on March 9, 1901. One was chloroformed on April 19th and cultures made. Scanty growth on one tube was found June 8th, and subcultures made.

Calf No. 26596, weight 132 pounds. Tested with tuberculin but gave no reaction. On December 4, 1901, 5 c.c. of a suspension of the fifth and sixth generation of Culture BB was injected into the right jugular vein. On the next day the temperature had risen to 103.2° F. After a slight remission it rose to 103° F. on the seventh day after inoculation, and continued to rise each day, reaching 106.4° F. by the fourteenth day, after which it fell slightly until death, which took place on December 21st, seventeen days after inoculation. The animal showed marked illness during life, the respiration reaching sixty-eight per minute.

Autopsy.—The lungs and the related glands showed macroscopically the most marked disease. Both lungs were thickly studded throughout, with remarkable uniformity, with miliary nodules, giving a sandy feel under the finger. The left was pneumonic, owing to the position of the calf for some time before death. Portions of the right were in a similar condition, sinking when placed in water. The bronchial and mediastinal glands were much enlarged and soft, and in the former small areas of caseation were found.

The liver was large, soft, and friable. Several nodules were visible on the surface, though not perceptible to the touch. The spleen showed very slight changes. The kidneys were normal.

Calf No. 26597, weight 202 pounds. Tested with tuberculin and gave no reaction. On December 4, 1901, 5 c.c. of a suspension of Culture BB of the fifth and sixth generations were injected into the peritoneal cavity. The temperature rose to 105.2° F. by the eighth day after injection, remaining very nearly the same until four days before death, when it began to fall, and reached 103° F. on the day before death, which took place on December 31st, or twenty-seven days from the time of inoculation.

Autopsy.—Great emaciation. Loss in weight thirty-seven pounds. The lungs were largely involved, though not uniformly. The central and posterior portions showed many areas deep red in colour and solid to the feel. These were thickly studded throughout with minute greyish nodules.

The suprasternal lymph glands were as large as goose eggs, and contained cheesy areas. The mediastinal glands were much enlarged, one being six inches in length by two inches in diameter. The peritoneal cavity contained about six quarts of straw-coloured fluid. The peritoneum was everywhere enormously thickened, and practically converted into a tuberculous mass. In several places it was one-half an inch thick and fibrous. The omentum was also enormously thickened and bound over the surface of the liver. It contained a great number of nodules, dense and fibrous, many with caseous centres. The liver was firmly adherent to the diaphragm, and on section showed many nodules. The spleen was firmly attached to the surrounding parts by a mass of partly organised fibrin, which contained many cheesy nodules. On section it appeared to be normal.

Cow No. 45030, about three years old, and weighing 660 pounds. On January 22, 1902, 2½ c.c. of a suspension of Culture BB of the seventh and eighth generations were injeected into the right jugular vein and the same amount into the peritoneal cavity. The temperature rose to 103.2° F. on the second day, then fell slightly during the next six days, after which it rose steadily, reaching the maximum 107° F. three days before death, after which it fell slightly, the animal dying seventeen days after inoculation. The lungs were mostly involved, both being thickly studded throughout with miliary nodules. Most of the left lung showed interlobular emphysema, while the inferior portion was much congested. On the omentum were numerous dark red spots which could be felt between the fingers. The spleen was adherent to the diaphragm, and there were many punctate hæmorrhages on the surface. The liver and kidneys showed no gross changes.

What interpretation is to be given to these remarkable results? One of two propositions must be admitted: either we have found a human tubercle bacillus having a pathogenic power for cattle quite as great as any bovine germ, or else we have found in the mesenteric gland of a child the bovine tubercle bacillus. If we accept the law of diagnosis laid down by Koch, namely, the inoculation test, the latter is the true explanation. I, myself, am strongly of the opinion that this latter is the case for the following reasons:

1. The history of the case as given by Dr. Hand, primary intestinal infection.
2. Morphologically and culturally the organism corresponds more nearly to the bovine type as first defined by Dr. Theobald Smith, and later by ourselves, than the human.
3. The great pathogenic power for cattle.

A second culture obtained from the mesenteric glands of a child has shown a virulence far in excess of that usually found in human cultures, though it falls short of Culture BB in pathogenic power. This culture, designated U, was isolated in December 1900 and tested for guinea-pigs and rabbits. The results, together with its manner of growing and microscopical appearance, led us to consider it a typical human culture. During

the summer of 1901 it was selected for some feeding experiments on puppies, and showed a degree of virulence that was not expected. In December last, wishing to produce a slow tuberculosis in a dog, this culture was again employed. The dog grew ill rapidly, and died in January, thirty-six days from the time of inoculation. Post-mortem examination revealed a typical and extensive tuberculosis, and it was decided to inoculate a calf in order to test its virulence for the bovine race. On March 4, 1902, Calf No. A45046, weighing seventy-four pounds, was inoculated in the jugular vein with 6 c.c. of a suspension of Culture U, of the twelfth generation, from glycerin agar, the suspension being equal in opacity to a twenty-four-hour-old culture of the typhoid bacillus in bouillon. The animal soon showed signs of illness, the breathing became rapid and laboured, reaching fifty-four per minute. Extreme weakness and depression came on, and it passed much of the time lying down. On April 19, 1902, it was killed, death seeming imminent.

Autopsy.—Weight eighty-two pounds. Condition fair. The anterior lobes of both lungs were thickly studded with minute nodules, averaging 1 mm. in diameter. Blocks from these lobes sank in water immediately. Both lungs were dense and solid to the feel throughout. The posterior lobes were air-bearing for the most part, but contained many solidified areas, which could be seen on the surface as well as on section.

The bronchial and mediastinal glands were enlarged and wet. Scrapings from cut surfaces show an enormous number of tubercle bacilli. In the mediastinal glands many yellowish nodules were seen. The pleuræ were normal. The liver was enlarged and firm to the touch. No distinct nodules could be seen by the naked eye, but throughout the substance yellowish areas were found in large numbers. The surface appeared marbled.

The spleen was enlarged and very firm, but no nodules could be detected. The kidneys showed numerous whitish areas on the surface, which were found to extend quite deeply into the cortex. On section many yellowish nodules were seen. The tissues of the kidneys were much stained with bile, and the pelvis contained a gelatinous or viscous material showing the same pigment. The peritoneum was normal.

Microscopical examination.—The solidified portions of the lungs contained large areas which are not air-bearing, the alveoli being completely filled with leucocytes and epithelium, or epithelioid cells. The small bronchi are filled by an exudate made up largely of leucocytes. The central portions of the nodules stain poorly, and fragmentation of the nuclei of the cells is seen, but no distinct caseation can be found. In sections stained with carbol-fuchsin innumerable tubercle bacilli are seen. In other parts of the lungs which are still largely air-bearing, minute nodules are found in large numbers, having the same general characteristics as those just described. Throughout the sections many tubercle bacilli are seen, and in the nodules they are in clusters. In the liver no typical tubercles are found, but there are many minute nodules made up of round-cells, and on the borders of these a considerable number of giant cells with peripheral nuclei occur. Sections stained with carbol-fuchsin show large numbers of tubercle bacilli clustered in these areas.

The spleen shows round-cell infiltration, giant cells, and many tubercle bacilli.

The white areas in the kidney described above show a round-cell infil-

tration and large numbers of tubercle bacilli. The bronchial glands show areas of beginning caseation, a few giant cells, and innumerable tubercle bacilli.

This calf showed a well-marked tuberculosis, proving that the culture with which it was inoculated had a degree of virulence above that usually found in cultures of human origin. Our experience with this culture leads us to believe that the usual method of employing only guinea-pigs and rabbits in testing the virulence of the tubercle bacillus does not always give entirely conclusive results. Unfortunately, the expense attending the use of larger animals hinders their more general employment.

History of Culture U.—Obtained from a child three years of age whose death was due to tubercular meningitis. Autopsy: lungs and bronchial lymphatic glands full of miliary tubercles. Anterior mediastinal glands much enlarged. Spleen extensively involved, liver less so. On abdominal surface of diaphragm were a number of flat, yellow nodules. Mesenteric glands enlarged, and contained old, yellow, cheesy nodules. One small tubercle found in the right suprarenal. Purulent and cheesy nodules found in meninges and encephalon. The cultures were obtained from the mesenteric glands.

The pathologist, Dr. Hand, was unable to decide with certainty as to the origin of this case.

Increase of virulence by successive passages through calves.—In another experiment instituted by Dr. Leonard Pearson we have proved that a typical tuberculosis can be produced in young cattle by large and repeated doses of a human culture of moderate virulence; and, what is even more interesting and important, by successive passages through calves we have succeeded in bringing about a marked increase in the virulence of this culture. The culture employed was isolated from human sputum in September 1899, and is designated "M."[4] The animals were inoculated at intervals of a week, the amount of culture being divided into four equal portions, which were injected into the jugular vein, the lung, the peritoneal cavity, and under the skin. Each week the dose was increased by 10 c.c.

Two calves were infected in this manner, Nos. 26562 and 26563. With the tissues of No. 26562 the serial inoculations were begun, the details of which, with the post-mortem examination of the animals, is given below. The result is shown in the following table:

No.		*Amount of Injection.*	*Length of Life.*
1.	Calf 26562 . . .	925 c.c.	106 days.
2.	,, A45020 . . .	16 ,,	48 ,,
3.	,, A45035 . . .	13 ,,	23 ,,
4.	,, A35047 . . .	10 ,,	24 ,,
5.	,, A45073 . . .	14 ,,	24 ,,

Calf No. 26562, weight 210 pounds. The first inoculation was made on September 6, 1901, and thereafter at intervals of a week until December 16th. Each time the total amount was divided into four equal parts and injected subcutaneously, intraperitoneally into the lung and into the jugular vein. The commencing dose was 10 c.c. of an emulsion equal in opacity to a twenty-four-hour-old bouillon culture of the typhoid bacillus, the total amount given being 925 c.c. The temperature rose after each injection, and remained high for two days, then fell gradually, though normal was never reached. About five weeks after the first injection the calf began to cough. The cough grew steadily worse until death, being most marked on

the day following each injection. Respiration grew laboured, and the animal lost flesh. By December 15th it was markedly ill. Death took place during the night of December 21st.

Autopsy.—Considerable emaciation. The lungs were hard and firm to the touch. The various sites of inoculation could not be detected, and there were no abscess cavities or scars. The lungs were dense throughout and heavy, though sections floated in water. The bronchi, especially the smaller ones, were filled with a tenacious mucus, in which many tubercle bacilli were found. The bronchial glands were enlarged, and a few caseous points were found. An emulsion made from one of them showed many tubercle bacilli. The mediastinal glands were large and soggy, but no nodules could be found. The liver was attached to its capsule at points which were the sites of flat, yellowish nodules, from 2 mm. to 5 mm. in diameter. On section tuberculous areas of considerable extent were found, reaching from the surface to a depth of 3 cm. The spleen was much enlarged and very soft. On the surface were a number of flat fibrous new growths. The kidneys showed no changes. The omentum was much discoloured, having a dirty, brownish appearance, and in parts much thickened. It contained upward of one hundred nodules 2 mm. to 6 mm. in diameter, some grey, some white, and some hæmorrhagic. Some had the appearance of beginning "grape" formation. The mesentery presented the same appearance. Its glands were enlarged and wet, but no cheesy nodules could be found. On the parietal peritoneum were a large number of pearly nodules 2 mm. in diameter, and a few sessile new-growths, some of which were hæmorrhagic, and had fringes of fibrin hanging from them. Microscopical examination of the tissues showed the spleen and kidneys to be free of tubercles. In the lungs the greater part of both is made up of conglomerated tubercles which show very little central caseation. The alveoli are completely filled with desquamated epithelium, leucocytes and epithelioid cells. There is a marked bronchitis.

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(*To be continued.*)

DISEASED MEAT PROSECUTION IN EDINBURGH.

HEAVY PENALTY.

IN Edinburgh City Police Court on Tuesday, May 27th, Bailie Brown gave judgment in the case in which Robert Stewart, cattle dealer, Craigielea, Milngavie, was charged with being the owner or consignee of a live cow and a live heifer which were deposited in the cattle siding at Haymarket Station with the intention of disposing of them for food, while they were diseased and unfit for food. The Bailie said he had given very great consideration to the evidence which was led before him. Having done so, he had no hesitation whatever in coming to the conclusion that accused was guilty of the charge. He therefore found accused liable to a fine of £25 in each case, or £50 in all; and having regard to the importance of this case, he should be greatly delighted to state a case for the superior court.

THE UNITY OF HUMAN, BOVINE, AND AVIARY TUBERCULOSIS.

A STRANGE story comes from France. M. Faure, veterinary surgeon at St. Denis, states, in the *Progrès Vétérinaire*, that he was called in to examine a four-year-old ox, which showed all the symptoms of intestinal and pulmonary tuberculosis. He subjected the animal to the tuberculine test and there was a typical reaction. The animal was slaughtered, and at the post-mortem M. Faure found very advanced intestinal tuberculosis, and pulmonary tuberculosis of more recent date. This ox had been bred by his proprietor, who had still in his possession the mother, a fine cow; this latter was, by permission of the owner, subjected to the tuberculin test along with two other cows, which with her composed the "stud." The three animals were found to be immune. On further investigation M. Faure found the grandmother of the ox to be also immune. She had been sold to a client of M. Faure's, but he found her out and put her to the test for his own satisfaction. M. Faure made a strange discovery in the course of his investigation. The owner of the animals had had a son who, some three years previously, was sent home from the army as suffering from tuberculosis. Every evening this lad was seized with violent fits of coughing, which generally caused him to vomit. When these attacks came on he used to leave the house and go to the byre by a side door, where he vomited quite close to the above-mentioned ox, then a bullock. The bullock, it ought to be stated, was kept at a distance from the cows on account of his irritability. M. Faure thinks that the bullock, when tossing about his litter, may have eaten part of it, and at the same time may have swallowed some of the young man's vomit, for the young man continued his practice for some ten months till he died. No other member of the family was tuberculous. M. Faure says the conclusion is irresistible that human tuberculosis is transmissible to cattle, and that this is a case in point.

M. Faure goes on to say that in fine weather the same tuberculous youth, the son of the farmer, was in the habit of sitting under a shed where the hens used to shelter themselves from the heat of the sun. Doubtless

the hens picked up some of the infective matter, for they soon showed signs of tuberculosis. Some had the joints of their feet swollen, others suffered from diarrhœa and were on the point of death, all were extremely emaciated and presented on the buccal mucosa and on the conjunctiva small greyish elevations, incrustations which could be broken away, and left exposed a red granular surface. The product obtained from this surface, when examined microscopically, showed the bacillus tuberculosis. A post-mortem of one of the hens showed calcified tubercular lesions in the liver, spleen, and intestines.

NORFOLK CHAMBER OF AGRICULTURE AND TUBERCULOSIS.

A MEETING of the Norfolk Chamber of Agriculture was held on Saturday in the Agricultural Hall, Norwich. Mr. George Cobon presided, and there was a numerous attendance of members. Among other matters discussed was the important one of

TUBERCULOSIS IN CATTLE.

Mr. KIDNER moved:—"This Chamber is strongly of the opinion that the time has arrived for bovine tuberculosis to be dealt with in a practical manner. It considers that full compensation should be paid when carcases are voluntarily surrendered in the public interest and destroyed so as to assist the *bona-fide* honest trader who cannot discover this complaint until the animal is killed. This meeting believes this course would tend towards stamping out this disease, and be the means of removing a great injustice that often occurs." Mr. Kidner said the vendor and the purchaser of a beast might be quite ignorant that it was suffering from any disease, and yet, after it was killed, the inspector could come down and condemn it. Such a state of things was not calculated to do farmers any good. There was a strong agitation on the part of butchers to combine with a view to securing a warranty from the farmers that the beasts they sold were not diseased. This would operate very disadvantageously against the farmers. It seemed to him that if beasts were destroyed in the public interest the public ought to pay for them, especially as there was a division of opinion as to whether the flesh of a beast suffering from tuberculosis was dangerous to human beings.

Mr. E. T. LEARNER, in seconding the motion, said no one looking at the living animal could tell whether or not it was suffering from tuberculosis. He knew of a gentleman who about six weeks since bought some cattle on Norwich Market for £27 a piece, one of which afterwards proved to be as full of tuberculosis as any beast could possibly be. Fortunately for him the inspector did not visit his premises just then, and he got off scot free. Last Saturday one of the largest buyers on Norwich Market was summoned before a London Bench of magistrates and was fined £10 and £5 costs because a beast, for which he had paid £14 : 10s. was suffering from tuberculosis. The time had come when compensation should be given to farmers for beasts suffering from tuberculosis, and then there would be no occasion for them to hide these matters from the inspectors. On the contrary, it would be to their interest to help inspectors.

Mr. H. M. UPCHER said this was a most important question, and he

was glad it had been brought before the attention of the Chamber. It affected the breeders and graziers of stock, it affected the butchers, and it affected the public. Healthy stock could not be bred from diseased parents, and farmers ought to be encouraged to disclose the presence on their premises of diseased cows. Dairy farmers and breeders of stock should be given compensation for cows that were found to be infected with this horrible and abominable disease.

Mr. B. WILSON was opposed to the resolution. There was a scare about tuberculosis, just as there was some time since about arsenic in beer At one time professors were prepared to swear that the milk of a cow suffering from tuberculosis would give the disease to children, and the flesh would give the disease to adults. But since then they had climbed down considerably, and now it was very questionable whether it was possible to convey disease from an animal to a man. He believed the whole thing was humbug from beginning to end, and he thought the resolution had better be withdrawn, for the scare was entirely dying out.

Mr. B. B. SAPWELL said the question was who were to pay for the beasts that were declared to be diseased—the farmer, who sold them innocently, the butcher, who bought them innocently, or the public, for whose benefit they were killed.

Mr. J. GOULDER said the resolution simply asked that those beasts that were killed for the benefit of the public should be paid for out of the public purse.

The motion was unanimously adopted.

(*Eastern Daily Press.*)

FOOT AND MOUTH DISEASE.

PROPOSED ORDINANCE *re* HAY AND STRAW IN GUERNSEY.

THE consideration of a draft of an Ordinance prohibiting the importation of hay and straw from France was resumed in the Royal Court, on Saturday, 17th May.

A lengthly discussion, in which Jurats De Garis and Ozanne, and Advocates W. Carey and Bishop took part, ensued, and Mr. Hocart, of the Vale, was heard and stated that he had been able to cure all the animals of his herd which had been infected with foot and mouth disease in 1872 or 1873.

Major Whitfield, States' Veterinary Inspector, gave evidence and said he was of opinion that foot and mouth disease could "not" be imported in forage, as the germ of that disease could not live in cut grass exposed to air and sun. He attributed the recent outbreak to refuse and filthy straw. The Court, after further discussion, resolved to hear more evidence, and adjourned the discussion to Saturday next.

(From the "*Guernsey Evening Press*," of May 24th).

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DREAMS.

In a most interesting article in the *Scottish Medical and Surgical Journal* for June Sir Arthur Mitchell says the following :—

"While we are using the thinking part of the brain's work in a state of wakefulness, we bring it under the control and direction of the *Will*. In other words, we do not allow it to go on without guidance. We direct it into certain channels and keep it there. We exercise an inhibiting power over it.

"It has often been pointed out that there is nothing more laborious than the sustained exertion of *Will*, whether it be employed in things so different as attending to a subject of study, or directing our limbs in unwonted action. In forcing attention the *Will* becomes fatigued, and it is the *Will* which comes to need rest and which gets it in sleep. In the *Thinking* which goes on in the state of sleep there is an absence of all sense of weariness. It is not then under control or direction. It seems, if I may so write of it, to be left free to sport, and through this free unrestrained play, as well as through the *Will's* rest from work, refreshment appears to come to what we call *Thinking*, the weariness of which may be regarded as arising out of a forced subjection to the directing power of the *Will*. It is that directing power, however, which chiefly demands rest through a cessation of work, and it finds it in sleep."

Now if this be the case, then surely a strong case is made out for the thinking power of at least one of the lower animals, namely, the dog—for who has not seen a dog when asleep go through all the motions as if galloping, and at the same time uttering little whines or whimpers as if in pursuit of prey.

Sir Arthur's article is one that all should read.

SCOTTISH METROPOLITAN VETERINARY MEDICAL ASSOCIATION.[1]

PRESIDENTIAL ADDRESS BY JOHN STORRIE, F.R.C.V.S., EAST LINTON.

Just yesterday morning we were looking forward to the celebration of a great event in the history of our country, the crowning of King Edward VII. and Queen Alexandra. We were preparing to join in that outburst of enthuisiasm which would have been exhibited over the length and breadth of the land. To-day a great shadow has fallen over us, we are filled with sorrow and anxiety at the serious illness of our King ; our earnest prayer and wish is that he may be spared suffering and soon restored to health, and that he may be soon crowned, and live long to reign over us.

I am sure there are no more loyal subjects in the world than the members of the veterinary profession, and I have been hopeful that there was a prospect of us receiving more public recognition of the services we have rendered to our country during the reign of King Edward VII. than we have done in the reign of his illustrious mother, Queen Victoria. With the exception of the Diamond Jubilee Medals and the Knighting of Sir George

[1] Read at a Meeting of the Scottish Metropolitan Veterinary Medical Association, on June 25th, 1902.

Brown, our services *pro bono publico* have been almost entirely overlooked. In almost every other country in the world honours and decorations are bestowed on veterinarians for public services,—not only that, but many Governments provide money and appliances for scientific investigation,—whereas to us not a scrap has ever been voted, all has to be done by private enterprise.

It is all the more creditable to the profession that we have done such good work without hope of public recognition, and without receiving pecuniary assistance, at the same time exterminating many contagious diseases much to our financial loss. Have we not eradicated Rinderpest, Pleuro-Pneumonia, Foot and Mouth Disease, and if the Board of Agriculture wish to stamp out Glanders, Swine Fever, Anthrax, Scab, &c., would their best course not be to place the matter unreservedly in the hands of veterinarians who would really know how to handle these diseases. I really trust the day is not far distant when we will be recognised as we ought to be, and laboratories will be provided where these and other diseases will be investigated at the public expense, for apart from the contagious diseases there are many others which were common and are now seldom or never met with; whilst those which we do more frequently meet with are treated and cured in a much more thorough and scientific manner, whereby the lives and usefulness of our patients are preserved to the profit and advantage of their owners.

When the question of Public Health is now commanding such great attention, and meat and milk are such important articles of human food, one would certainly think that the question of soundness of meat and the health of dairy cattle should be in the hands of veterinary surgeons, who have been trained and educated for that special purpose. Every one must know that dairy inspection as it is carried out under the Public Health Act is little better than a farce.

I am acquainted with a veterinary surgeon who holds four appointments, three in burghs, and one in a county district,—nominal appointments I should have said. During the last twelve months he came across nine or ten cases of cows in dairies—called in to see them in a private capacity—in the last stages of disease, some having tuberculosis, others septicæmia from having retained the fœtal membranes and from mammitis. These cows had without doubt been suffering from these diseases for weeks and some for a longer period, and all the time their milk had been consumed by human beings and possibly by infants. I have no doubt this same state of affairs exists in nearly every burgh and county of Scotland; verily the Public Health Act, as far as the dairies' section is concerned is little better than a dead letter. I can safely say such a state of affairs would not exist if veterinary surgeons had their proper standing under that Act.

I am sure we are all thankful that the War is now over, and it is to be hoped that the War Office will see the necessity of placing the Army Veterinary Department on a much higher footing. No doubt a small step has been taken in that direction, but it looks as if it had been given most grudgingly, at least it could not have possibly conceded less. The position seems most remarkable, seeing how dependent they were on the services of the veterinary profession throughout the campaign both on land and sea.

It has been suggested to boycott the Army Veterinary Department for a time, but I am afraid that idea would not work well; however, some-

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thing must be done, and it is difficult to know which is the best method of trying to remedy this and the various other injustices under which we are labouring. Is it by agitating at meetings such as ours? Is it by the assistance of the veterinary journals which are in circulation? I doubt not. I rather think that tact and individual effort would do more to put matters on a satisfactory footing, if each and all of us were trying to impress upon those in authority with whom he may come in contact that we were entitled to public recognition.

I should like to say a few words on anthrax, more particularly Burial *versus* Cremation, in fact I am almost bound to do so.

Some little time ago the East Lothian Contagious Diseases Animals Committee and the County Council, and especially their veterinary inspectors, were taken to task by an Edinburgh doctor, who poses as an authority on all public health matters, and whose name is occasionally seen on leaflets certifying that certain goods are good and nourishing food for infants and such-like. This worthy gentleman had read a report of a County Council meeting where one of the members had brought up the anthrax question, and who asked how the anthrax carcases were disposed of. The answer was that the veterinary inspectors considered that burial was a practical and satisfactory way of disposing of the carcases. This seemed a terrible proceeding, and the doctor wrote to the local papers condemning the action of the veterinary inspectors, and expressing a wish to know what the veterinary profession at large thought of the incapacity of the Haddington officials.

This attack could hardly be allowed to pass, and I replied to the letter in a very mild manner, and tried to show that burial as it was carried out was a fairly safe method of disposing of the carcase, and until a practical plan of cremation was brought forward the former was much the safer of the two. However, on the back of this, one of the medical officers of the county took the matter up, and charged us with being ignorant of the study of bacteriology, at the same time, for our enlightenment, giving a few details of the life and character of the anthrax bacillus. He then propounded an elaborate, cheap, and easy method of cremation. A deep hole was to be dug, straw, wood, and coal put into it, iron rails placed across it, and the carcase put on the gridiron, and paraffin was to be poured over everything.

Now, this would read all very well in a story-book, but practical men know perfectly well what a difficult matter it is to thoroughly dispose of a green carcase by burning, and an expensive one to boot,—the medical gentleman telling of a case in his experience where £13 had been spent in getting rid of one carcase.

Now, with regard to burial, it has been satisfactorily proved that if the carcase is buried unopened intact in its skin, the putrefactive organisms wage war against the anthrax germs inside the body, and totally destroy them. In the event of the carcase having been opened there is a much greater risk, but even then, if everything is buried at a certain depth and within a given time, the danger can be reduced to a minimum, as the bacillus must have air and a certain temperature, neither of which it can have if properly buried.

It is when spore development has taken place that the real danger of the spread of anthrax comes in, but this is so wonderfully regulated by nature that with ordinary care and management it should not be allowed to occur.

We know that with a temperature of something like from 55° to 63° F.

spores may be developed not sooner than twenty-four hours after death, and these at best are, as a rule, rather sickly specimens with no great tenacity of life. With a lower temperature of, say, from 38° to 50° they may be developed not sooner than forty hours after death.

Thus to get strong, healthy spores the carcase or some part of it must lie opened and exposed to the atmosphere at a given temperature for about forty hours.

Consequently, where an outbreak of anthrax comes into the hands of the veterinary inspector without the carcase having been interfered with, there should not be much difficulty in destroying any possible source of contamination. This being so, if importation of the disease could be put a stop to, I am certain we would lose sight of it altogether in certain districts where the ground is not already impregnated with it.

As far as East Lothian is concerned, I am perfectly certain that nineteen out of every twenty outbreaks can be traced to foreign feeding stuffs, cakes or meals.

This is so strongly impressed upon our County Council that they have appointed a committee to go into the subject along with the veterinary inspector, and I hope at some future date to give you the result of the inquiry.

Gentlemen, I must thank you for again having elected me President for another year. I assure you I shall do my utmost for the good of the Society. There is room for improvement in the attendance at our meetings. I am sure that many of our professional brethren round about would be greatly benefited by joining us.

There is one suggestion I wish to make, and that is, that a communication should be read by a member at each meeting. It would be the means of opening up a good discussion, and I understand the Secretary has some difficulty in procuring a paper for each meeting.

WAS IT AN ELECTRIC SHOCK?

On Saturday evening, 26th May, as a man named Crook, in the employ of Mr. J. Gibbons, coach proprietor, was driving a pair of horses attached to a waggonette along Piper's Row, Wolverhampton, one of the animals suddenly jumped into the air, fell down, and shortly afterwards expired. It was supposed that the animal had received an electric shock by coming in contact with one of the studs which are laid between the rails, and from which electric motive power is conveyed to the car. The officials connected with the Lorain Company, who are laying down the traction system, however, deny that the animal met its death by being electrocuted, as the studs in the locality of the occurrence, on being examined after the accident, were found to be "dead," or in their proper condition, and a veterinary surgeon who made a post-mortem examination failed to discover that death was due to electric shock. Earlier in the day two horses attached to a Great-Western Railway Company's waggon also fell to the ground in Bilston Road as if they had received an electric shock, and one of the drivers was affected in a like manner, and to such an extent that he sought relief from a sensation, as he described it, like "pins and needles running into him," at the hospital. He was there examined by one of the resident surgeons, who came to the conclusion that he had received a shock, but was not

seriously injured, and was advised to remain quiet for an hour or two. He was not detained at the institution, and on making inquiries at his home yesterday we were informed that he was none the worse for his mishap.

Mr. Alex. P. Trotter stated in his report:—"The tramways are worked on a surface contact system: blocks are placed at intervals in the street containing a contact which is worked by powerful magnets carried on the car. When the car passes, the pieces of iron which produce the contact are allowed to drop. Should one of these fail to drop, a horse treading on the block would probably be killed, but a foot passenger treading on it would receive a shock which would not be dangerous to life, but which would make him stumble and be run over. I have examined the details of the contacts, and I think an accident to a horse is unlikely, and the risk of an accident to a foot passenger very remote, but as there is no experience in the use of this system, I recommend, subject to the report of Colonel Yorke, that sanction be given for the working of this system for twelve months."

The Board of Trade, in forwarding these reports to the Town-Clerk of Wolverhampton, intimated that they were prepared to grant a licence for twelve months for the working of the lines on the Lorain surface contact system.

Extracts.

OLD STANDING CASE OF PUS IN THE SINUSES OF THE HEAD—CURE—REMARKS ON THE IRRITANT NATURE OF SOME OF THE ANTISEPTICS USED.

BY MM. GUILLEMAIN AND CADIX, V.S., FRENCH ARMY.

THE subject of this case was a handsome English thoroughbred, the property of an infantry officer.

In April 1899 he began to suffer from a discharge from the right nostril and enlargement of the glands in the intermaxillary space. He was at once placed in charge of a veterinary surgeon and tested with mallein without result. The right sinus was then trephined, and he remained under treatment for five months. At the end of this time, although the discharge was still profuse, the owner was advised to use him, and see if work combined with antiseptic injections would not effect a cure.

This advice was followed till the end of December without the slightest improvement, when we were called in and the case came under our care. The first step taken was to trephine the superior maxillary sinus, the others being already opened. This operation was performed only as an explanatory one, but we discovered in it some plugs of cotton wool in a fœtid condition, which were removed with forceps. The sinus was well washed out with a warm boracic solution, and the lining mucus membrane seen to be thickened, very vascular, and covered with small irregular ulcerations of a bright red colour.

The treatment prescribed was a warm solution of cresyle 1 per cent. morning and evening, for fifteen days, and then daily for another like period. Under this treatment the discharge decreased, but not so much as we had expected; so on 1st February a warm boracic solution was substituted

for the cresyle, and the syringe, by an irrigator formed of an indiarubber tube 10 feet long, at one end of which was fixed a large funnel, and at the other a nozzle, 16 inches in length, the end of which was flexible and curved.

The sinus was irrigated morning and evening for ten days, and then daily, the runner of the apparatus being raised on a ladder, and about two quarts of the fluid used each time. The nozzle was inserted into the cavity, so that a constant stream was directed against every portion of the lining membrane. The results of this plan soon became manifest, and on 10th February the discharge both from the nostril and the inferior maxillary sinus was insignificant.

The cresyle solution was used 1 to 100, 1 to 200, and lastly 1 to 400, but as the case did not improve we had recourse to the borax.

From 8th to 16th February biniodide of mercury, 1 to 80,000 was tried, but the results were as bad as the cresyle, and the boracic solution again was used, with the result that the cow was discharged cured on March 30th, since which time, the owner has informed us, the horse has enjoyed excellent health, without the slightest appearance of any discharge. The interesting features of this case appear to be the following three points:—

1. Precautions to be taken to prevent the temporary dropping into the sinuses.

They should be cone-shaped, and wrapped in gauze, so that they protrude at least half an inch from the wound; also to prevent the patient knocking them out he should have a linen band put on. It is also a good plan to put a stitch through the plug and the hood.

2. Advantages of the irregular over the usual syringe.

The jet from the syringe is broken into a spray against some of the convolutions of the sinus, the result being that the fluid does not reach every part, and the adherent secretion is not completely washed away. A syringe with an indiarubber nozzle, on account of its flexibility, is not of much use. The irrigation apparatus we made use of, on the contrary, not only permits of a continuous jet of uniform strength being used, which does not frighten a nervous animal, but from the slight curve of the nozzle it can be directed into all the angles formed by the walls of the sinus.

It would also appear that this method of irrigation, by completely washing from the mucous membrane all secretion, contributes to get rid of the myriads of microbes that exist in it.

3. The strength and nature of the fluid employed.

It would appear that strong solutions should not be used. In this case weak ones were employed, especially warm boracic acid, with the hest results.

(*Recueil de Médecine Vétérinaire*, 15th June 1902, page 350.)

JOSHUA A. NUNN,
Vety. Lieut.-Colonel.

CANCER OF THE CLITORIS IN A MARE.

BY M. NAUDIN.

THE patient, a roan mare fifteen years old, was brought to Alfort under the care of M. Cadiot, to be operated on for a tumour situated on the vulva, that had existed for about a year. The growth had increased

rapidly to the size of a man's two fists, and was divided into three lobes, fixed to the inferior part of the vulva by a short pedicle, the mass hanging down on to the perinæum. The pedicle was about 2 to 3 inches in diameter, intimately connected with the labiæ and inferior commissure, and completely enveloping the clitoris in its substance, but not involving the meatus, urination being performed without difficulty. Both the pedicle and the adjacent parts of the vulva and perinæum had a scirrhous feeling, the membrane on the surface being smooth and tense; although the whole was nodulated and granular, resembling the surface of a cauliflower. Its surface was in parts ulcerated and secreted a sanious pus, with an infective odour, in considerable quantities, which ran down over the perinæum and inside of the thighs. When touched or handled it easily bled. The sub-lumbar ganglia when examined per rectum were hypertrophied, hard, and nodulated.

M. Cadiot operated on February 11, removing the growth with a bistoury, but in spite of a careful dissection some small islands of the growth were left on the wound, which were removed by the curette and thermo-cautery. The mare bore the operation well, feeding as soon as she returned to her box.

The tumour weighed about 1lb., and on microscopic examination it was seen to be an epithelioma. Sections stained with picro-carmine. Trabeculæ of conjunctival tissue surrounding islands of epithelium of all shapes and sizes were seen, the smallest of which were deeply stained with carmine, the largest yellow in the centre showing that keratinisation had commenced.

The growth, which had originated from the mucous membrane of the clitoris, and extended to the walls of the vagina, was of the same nature as that seen on the glans penis of the horse, but is much rarer.

In the clinical notes which M. Cadiot has placed at my disposal, I can only find mention of two similar cases, one being the same as this, only the tumour being much smaller. The other was a secondary growth on the clitoris, the animal primarily being affected with cancer of the stomach.

(*Recueil de Médicine Vétérinaire*, June 15, 1902.)

JOSHUA A. NUNN,
Vety.-Lieut.-Colonel.

PIROPLASMOSIS IN THE DOG.

M. NOCARD, at a meeting of the Société Centrale on 1st May, recalled a former paper of his on hæmoglobinuria in the dog, a disease which more careful study had shown to be connected with the presence of hæmotozoa (piroplasma) analogous to those of Texas fever; a quantity of blood taken from a dog suffering from the disease was injected into the jugular of a healthy dog, and produced the disease with all its symptoms. This experiment was the starting-point of a long series of observations. Piroplasmosis is not rare in France, and sometimes occurs in Italy. It is pretty common in Africa, and is mentioned by Koch as occurring in East Africa. In the Cape Colony it is known as bilious fever, malarial fever, or malignant jaundice. Professor Nocard drew the Society's attention to a paper by Mr. Duncan Hutcheon in the VETERINARY JOURNAL (1899, page 399), speaking in high praise of Mr. Hutcheon and of another Scotsman, Mr. Spreull, who wrote on the same subject.

CLINICAL STUDY OF THE DISEASE.

Canine piroplasmosis presents from the clinical point of view two quite distinct forms; in the one the evolution is rapid and is almost always followed by death; in the other the evolution is slower, and generally ends in recovery. In the acute form the disease shows itself by want of appetite, and by general dejection. The dog lies in a corner indifferent to his surroundings, deaf to the calls of his master. Fever has set in, and the temperature rises to above 40° (Cent.), where it remains for two to three days, and then falls below the normal; it may go down to 33°, but the oscillations are great, and the actual fall takes place slowly and gradually. In quite young dogs which succumb rapidly to infection the hyperthermia at the beginning is often wanting; as soon as the intraglobular parasites appear, the temperature descends till death supervenes. Throughout the whole course of the disease the anorexia is complete: the nose is dry and hot, the animal lies crouched in a corner, the eye is dull and insensible to excitement. The mucosæ (eye and mouth), at first pale, become gradually violet-tinted, then slightly jaundiced as soon as the temperature falls, but the jaundice (icterus) is not constant, and its intensity is very variable; in sixty-three cases of rapid course M. Nocard observed it thirty times; in the remainder the mucosæ remained more or less pale, occasionally a bluish tint being observable. When there is icterus the sclerotics and teguments are affected as well as the mucosæ. The pulse is quick (120 to 160 per minute), small, thready, sometimes intermittent. Respiration is quickened (36 to 48 per minute), painful, gasping, and often in young animals accompanied with moans. In a few rare cases there is vomiting—sometimes irrestrainable—of mucous greenish matter. Examination of the chest reveals nothing abnormal. When the hand is passed over the belly hypertrophy of the spleen can sometimes be found, but this is far from being the rule. General sensibility has gone; the patients respond to no excitement, and hardly notice the operations performed on them. From the outset the gait is awkward, painful, staggering, and this is specially true of the hind-quarters; then paresis sets in, the animal rises with difficulty and falls when forced to walk. During the period of low temperature paraplegia is almost absolute; as death approaches the animal falls into a state of coma, and dies quietly and without a struggle. Once only did M. Nocard observe real tetanus convulsions, and the animal died with all its muscles contracted.

As soon as the first symptoms appear—even when no parasite is visible—the urine is albuminous, and will remain so till death; the quantity of albumen increases with the number of the parasites. Often the urine is pink, dark red, or black like coffee-grounds, but this coloration is not due to the presence of blood in the ordinary way, for red globules have never been found in the urine; it is hæmoglobinuria, not hæmaturia. The hæmoglobinuric crisis generally begins shortly after the appearance of the endoglobular parasites. In acute cases, especially in very young dogs, it continues till death. At the post-mortem the bladder is found distended with urine as dark as prune-juice. Should the animal survive a little longer the hæmoglobinuria disappears, and the urine becomes again dark yellow, sometimes distinctly icteric. Hæmoglobinuria is not an invariable symptom; in six cases observed by M. Nocard it was observed only thrice, but as it is sometimes fugitive it may have passed unperceived. Of sixty-

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three dogs which died in his hands after inoculation, forty-three had hæmoglobinuria more or less intense and lasting.

The blood is profoundly modified. It is pale as if it had been mixed with water; coagulation is slow, and the clot is softer and not so dark in colour as usual; the serum is of a dark red tint, and grows darker with time; it seems that the fragility of the globules, already noticeable in the healthy dog, increases under the influence of the disease. In the subacute forms, when the hæmoglobinuric crisis has given place to the icterus, the serum exuded from the clot has a very dark yellow colour, sometimes with a greenish tint. The injury to the blood does not consist only in the serious diminution of the number of the corpuscles; when examination is made of a preparation of fresh blood, or one which has been coloured after fixation, one is struck with the varying dimensions of the red globules; in some the diameter is greater than the normal to the extent of one-third, in others a half, and in others two-thirds. They seem paler, and they fix the colour less intensely; further, one may observe, on coloured preparations. an abnormal number of nucleated globules. This globular degeneracy is still more marked in the slower forms. The acute form of the disease generally ends in death two or three days after the appearance of the first symptoms.

(*To be continued.*)

Review.

ANNUAL REPORT OF THE SANITARY AND MARKETS DEPARTMENTS OF THE CITY OF EDINBURGH FOR THE YEAR 1901. By A. MAXWELL WILLIAMSON, M.D., B.Sc.

In Dr. Williamson's Annual Report to the Town-Council of Edinburgh for 1901 it is interesting to observe that nearly half of 1 per cent. of cattle carcases were seized and destroyed; that tuberculosis occurred in 52 of these cases, being a proportion of 16·8 in cows alone, and that in eight cases, or 15·3 per cent. in the cows, the udder was affected with tuberculosis, and of these cases three had been detected by the veterinary inspectors in byres in the city, and removed for slaughter.

We append an interesting Table showing the diseases from which the condemned animals suffered:—

DISEASE.	Cows	Bulls	Bullocks.	Heifers.	Calves.	Pigs.	Sheep	TOTALS
Inflammatory condition of Chest,	5	—	—	—	—	—	1	6
Do. of Abdomen,	30	—	2	—	50	1	3	86
Do. of Mammæ,	—	—	—	—	—	—	1	1
Tuberculosis, ...	54	1	10	3	—	2	—	70
Fevered, ...	28	—	—	—	—	—	—	28
Suffocation, ...	2	—	4	—	—	—	65	71
Dropsy, ...	5	—	—	—	—	1	23	29
Septicæmia, ...	1	—	—	—	—	—	—	1
Milk Fever, ...	1	—	—	—	—	—	—	1
Anthrax, ...	1	—	—	—	—	—	—	1
Hepatitis, ...	1	—	—	—	—	—	—	1
Otherwise Unmarketable, .	13	4	3	—	2	8	59	89
TOTALS, .	141	5	19	3	52	12	152	384

Notes and News.

THE LIVERPOOL SCHOOL OF TROPICAL MEDICINE.

During the researches of the seventh expedition of the Liverpool School of Tropical Medicine, which visited the Gambia in the summer and autumn of last year, an important discovery was made of the animal parasite "tympanosoma." It was discovered that the presence of this parasite in the blood is closely connected with disease in Europeans, which had not been previously recognised. The parasite is very similar to the blood parasite, which is the cause of the devastating disease prevalent among cattle, horses, &c. in Africa, India, and other tropical countries. In animals it has been proved that these diseases are communicated through the agency of certain biting insects, such as the tsetse fly. The expedition discovered the "tympanosoma" parasite in the blood of a native child. The Committee of the School have now resolved to despatch a new expedition to the Gambia and to Senegambia to study the disease further. The expedition, which will start in a month, will, as at present organised, consist of Dr. J. Everett Dutton (Walter Myers Fellow in the Liverpool School of Tropical Medicine), and Dr. J. L. Todd, of M'Gill University, Montreal. Its principal object will be to investigate the conditions under which the disease occurs in both Europeans and natives, and its distribution, and also to ascertain how it is conveyed from man to man. Passages for the members of the expedition have kindly been placed at the disposal of the School by the Chairman, Sir Alfred L. Jones, K.C.M.G.

(A veterinary surgeon might possibly be of some value in such an expedition.—*Ed.* V. J.).

DEATH OF "FARMER" MILES.

The most celebrated ridgling castrator in the world, T. C. Miles (known internationally as "Farmer" Miles), died at Charleston, Ill., in March, aged seventy-five years, having been born in Kentucky in 1325. For almost half a century he has followed the business of a professional castrator, preferably doing the operation upon cryptorchids, and has instructed many students and veterinarians in his methods of procedure, both upon animals and birds. It has been said that the peculiar length and shape of his fingers was a potent factor in his success. He was also the inventor of many instruments designed for emasculation, the ecraseur bearing his name having been a standard instrument for many years, while his caponizing outfit is probably the best on the market. He gave to the veterinary profession two sons—one a graduate of M'Gill, the other of the Chicago College.

ANTIRABIC TREATMENT AT BORDEAUX.

The Antirabic Institute of Bordeaux was founded by the Municipality of that city in 1900. In the *Annales de l'Institut Pasteur* of May 25th, the Director, Dr. G. Ferre, gives a brief report of the work done since the establishment of the Institute. From May 19th, 1900, to May 18th, 1901, the number of persons treated was 100. Among the animals which inflicted the bite were 88 dogs, 10 cats, 1 pig, and 1 rabbit. There has been no death.

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Anthrax has broken out in North Northamptonshire in widely different districts. In some cases the animals affected have been cremated.

Swine Fever is very prevalent in Leeds, several fresh outbreaks having occurred in different parts of the city recently.

A NEW TEST FOR FORMALDEHYDE IN MILK.

In the process of estimating nitrogen by the Kjeldahl-Gunning method in a number of samples of milk which had been preserved with formaline, A. G. Luebert (*Journal of the American Chemical Society*, September 1901, p. 682) noticed a peculiar violet colouration of the potassium sulphate crystals and of the sulphuric acid surrounding them. This was especially marked when the milk was added to the potassium sulphate, and the acid carefully poured down the side of the digestion flask, so that the liquids did not mix, and did not occur with milk which contained none of the preservative. He recommends the following test:—5 grammes of coarsely powdered potassium sulphate are placed in a 100 c.c. flask, 5 c.c. of the suspected milk are distributed over it by means of a pipette, and 10 c.c. of sulphuric acid (specific gravity 1.84) carefully poured down the side of the flask. The whole is now allowed to stand quietly until the colour develops. If formaldehyde is present, the violet colouration occurs in a few minutes; if none is present, the liquid will at once assume a brown colour, rapidly changing to black. The test is said to reveal the presence of one part of formaldehyde in 250,000 of milk.—*American Journal of Medical Sciences*, March 1902.

At their Majesties' dinner party on June 15th, Veterinary Lieutenant-Colonel C. Clayton had the honour of being one of the guests.

THE DICK VETERINARY COLLEGE.

The Lord Provost's Committee recommended that the salary of the Professor of Veterinary Surgery and Materia Medica in Dick Veterinary College be increased from £225 to £250. The approval of the report was moved by the Lord Provost and seconded by Sir Andrew Macdonald.

Mr. CARMICHAEL, in moving the disapproval of the recommendation, said the salaries paid to the Professors in the Dick College for the past year amounted to £1258, while the students' fees amounted to £1082, or £176 less than was paid to the professors. There was a loss on that College for the past year of £734, although £210 had been given to the College by Miss Dick's Trustees, otherwise the loss would have been £944. The advance from the Common Good last year was £1038, and there was then an accumulated deficit of £1507. In these circumstances he did not think the Council should make an addition to the salary of any one connected with that Institution.

Dr. CULLEN, in seconding the amendment, said he did not think that was an Institution which they should be supporting at all. He thought it should be amalgamated with the other College or be handed over to the University authorities. They would not make so much of it in the future as they had done in the past, because a large number of the students were Irishmen, who had now a veterinary school in Dublin, and he thought one College was sufficient for Edinburgh.

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THE LATE W. IVISON MACADAM.

Sir ANDREW MACDONALD said it was just a question whether they should give that increase or run the risk of losing a very able man, who was being paid a miserable salary for the work he was doing. As to Dr. Cullen's remarks, that was a matter which they were at present considering in connection with the munificence of a citizen, and the result of that might be to relieve them of the Dick College altogether.

Our readers will be pleased to learn that a loyal and dutiful address, on behalf of the Council, Fellows, and Members of the Royal College of Veterinary Surgeons, has been presented to His Majesty the King.

Obituary.

THE LATE PROFESSOR W. IVISON MACADAM.

READERS of the VETERINARY JOURNAL may have read in the daily press an account of the tragic circumstances attending the death of Mr. Macadam, which took place on the 24th of last month, the very day on which the news of the King's illness was made known. We think it right to give, for the benefit of those who did not notice any account of the sad occurrence, the following report, partly gathered from the *Scotsman* of 25th June :—

"A painful tragedy occurred in Edinburgh yesterday. Mr. Ivison Macadam, the well-known lecturer on chemistry and prominent Volunteer officer, was shot and instantaneously killed in the laboratory at the Surgeons' Hall by a porter employed there, while a student was mortally wounded, and died a few hours later. The news, spreading with great rapidity, caused the most profound regret. At first, indeed, it was hardly credited, for to those who had seen Colonel Macadam only a few hours previously the picture of health and energy, it seemed impossible to believe that one who was so general a favourite had been laid low by a murderous hand. To his military friends especially his death was a painful shock. He had been prominently before them in connection with the detachment going to London in connection with the Coronation, having been appointed commander of the Second Scottish Volunteer Coronation Battalion, and he was to have sailed with his men in the afternoon. Many of them were on their way to the parade when they learned that their commander had been shot dead. The young man who shared Colonel Macadam's fate was James Bell Forbes, a student at the Surgeons' Hall. Their assailant was a middle-aged man, an army pensioner, named Daniel M'Clinton, who had been employed as a porter and general servant for several years at the laboratory. Being a Volunteer and a good marksman, he was in possession of a rifle and ammunition. Nothing definite is known as to any differences between M'Clinton and his employer, but apparently the former imagined he had some grievance. Yesterday forenoon shortly after eleven o'clock he entered the laboratory carrying his rifle—no unusual circumstance—and without warning he fired two shots at Colonel Macadam, who was pierced through the body and instantaneously killed in presence of his brother and several assistants. A third shot was fired at one of the staff, fortunately without effect, and two more at Mr Forbes, the student, with fatal results.

Mr. Stevenson Macadam succeeded in inducing M'Clinton to give up his rifle, and he was then arrested.

"Mr. William Ivison Macadam was the eldest son of the late Dr. Stevenson Macadam, the well-known analytical chemist and lecturer on chemistry. He was born about forty-six years ago, and after being educated at the Royal High School, the Edinburgh Collegiate School, and at Heidelberg, he became associated with his father in his work at the Surgeons' Hall Laboratory. Mr. Ivison Macadam rapidly became known as a worthy coadjutor to his father. He was keenly alive to the importance of his profession, and was ever on the alert to keep himself abreast of the times, alike in theory and in practice. He was frequently consulted by his professional brethren, by whom his advice was much valued. His work gained recognition from many learned societies. For some twenty years he was on the teaching staff of the New Veterinary College. He was a Fellow of the Royal Society of Edinburgh, the last President of the Royal Scottish Society of Arts, a Fellow of the Institute of Chemistry, and of the Chemical Society of London. To the proceedings of all these bodies he contributed numerous papers on professional subjects.

"Mr. Macadam's career as a Volunteer extended over a period of fully twenty years. As a young man he joined the 5th (Leith) Volunteer Battalion of the Royal Scots, and, largely on his initiative, a company of that regiment was raised in Portobello. During the twelve years he was captain it was second to none in strength and efficiency. In 1882, as a lieutenant, he sat as a lieutenant at the first examination open to Volunteer officers, and was awarded special mention. In 1887 he presented himself for the highest grade certificate in tactics, and was again successful. It was to Captain Macadam that Colonel Maclagan entrusted the command of the field firing with ball cartridge experiments at Aberlady in connection with the camp of 1889, this being the only time it had been attempted in Scotland by Volunteers. Captain Macadam's elaborate analysis of the results received warm praise. Major Macadam held commands in all the more important tactical field days, such as that at Lawfield, Gilmerton, Kingston Grange, and the defence of the Blackford Hill. Ultimately he became commandant of the battalion. In July 1896 he succeeded Colonel Cranston as Brigade-Major of the Forth Volunteer Infantry Brigade, under the command of Brigadier-General Macdonald. On the re-formation of the Brigade as the 1st Lothians he was retained as Brigade-Major on Colonel Broadwood's staff.

"Few men were more widely known in Edinburgh or more affectionately regarded than was Colonel Ivison Macadam. He was a man of varied interests. To scientific men he was known as a clever and highly qualified analytical chemist, an able and interesting lecturer on that subject, and a prominent and useful member of many learned societies. Among Freemasons he was known as one of the most enthusiastic members of the craft, and a leading officer in many of its orders. But it was as a Volunteeer that he was most widely known to the general public. Latterly his appointment as Brigade-Major for the 1st Lothian Volunteer Brigade brought him into touch with both the regular and the volunteer officers of the district, and by all he was admired and respected alike for his genial personal qualities, his sound military instincts and accomplishments, his organising abilities, and his capacity for hard work. The tragedy of his death was deepened by the fact that it came on a day when he was to

command a special representative Volunteer Battalion to take part in the Coronation celebrations. To the making of the arrangements for the journey to London his main attention had been directed during the last few weeks. It was an arduous, worrying, and somewhat thankless work, but Colonel Macadam as usual did not spare himself. The voluminous correspondence, the numerous details, each petty in itself, but in the sum making the difference between failure and success, had his personal attention, and if he asked those who were associated with him to work hard, he did not spare himself. His arrangements were all but completed. A summary of his Brigade Orders for the trip to London was published in *The Scotsman* only a day or two ago. Colonel Macadam was looking forward with interest and hope to the Coronation day duties. He knew that they would be arduous, but the prospect of a hard day never deterred him.

"Colonel Macadam became a Freemason eighteen years ago, when he was initiated in the Roman Eagle Lodge (No. 160), and during all that period he was an enthusiastic member of the craft, taking an active part in everything connected with Masonry. In 1889 he was elected R.W.M. of St. Stephen's Lodge (No. 145), and since he became a member of Grand Lodge, as Proxy Provincial Grand Master of Jamaica, he took the warmest interest in the work of that body, having been Grand Sword Bearer and Grand Director of Ceremonies, and for the past six years Chairman of the Metropolitan Visitation Committee, an office which he held at the time of his death. He was also the Past Depute Grand Principal of the Supreme Grand Royal Arch Chapter of Scotland, and Past First Principal of Chapter 83, and he took a leading part in the erection of the new Royal Arch Halls in Queen Street, which were handed over by him in the absence of the Grand Principal, the Earl of Haddington. During the erection of these halls he was Chairman of the Building Committee, and his energy and zeal in the movement added greatly to the success of the undertaking.

"Colonel Macadam is survived by a widow, two sons, and three daughters."

To this very full and justly appreciative notice, we would only add for our own part that Mr. Macadam joined the staff of the New Veterinary College so far back as 1873, when he became assistant to his late father, Dr. Stevenson Macadam. In the year 1880, when Dr. Stevenson Macadam resigned, Mr. Ivison Macadam was appointed Professor of Chemistry, and he held that appointment at the time of his death. He was a man of great ability, and had a profound knowledge of his subject. He had an excellent way with young students, and made the learning of chemistry a pleasant task. There was also a frank *bonhomie* about Macadam, and no one was better than he at telling a good story in the volunteer camp or at the dinner-table. At the New Veterinary College we shall feel his loss very keenly; we shall miss a loyal colleague, a brilliant man of science, and a warm supporter of the veterinary profession.

CONTAGIOUS DISEASES ANIMALS ACTS, 1864 AND 1890.

SUMMARY OF RETURNS OF OUTBREAKS for the Four Weeks ending 14th June 1902.

ENGLAND AND WALES.

Swine Fever.	Anthrax.	Glanders (including Farcy).	Rabies.	Sheep-Scab (for month of May).
Outbreaks 175 Slaughtered 713	Outbreaks 54 Attacked 101	Outbreaks 84 Attacked 145	Dogs Attacked 2 Other Animals 2 Destroyed 10	Outbreaks 19

SCOTLAND.

Outbreaks 1 Slaughtered 3	Outbreaks 12 Attacked 12	Outbreaks 1 Attacked 2	None.	Outbreaks 6

IRELAND.

Outbreaks 22 Slaughtered 321	None.	None.	None.	Outbreaks 27

Communications, Books, Journals, &c., Received.

Agricultural Journal (Cape of Good Hope); Berliner Thierärztliche Wochenschrift; La Clinica Veterinaria (Milan); Deutsche Thierärztliche Wochenschrift; Tannoform in Veterinary Medicine (March); The Sanitary Journal; Scottish Medical and Surgical Journal; Veterinary Record; La Riforma Veterinaria; Le Mois Scientifique (Paris); L'Echo Vétérinaire (Liège); Annales de Médecine Vétérinaire (Brussels); Johns Hopkins Hospital Reports; Journal of Comparative Medicine and Veterinary Archives; Recueil de Médecine Vétérinaire; Gazette Médicale de Paris; Modern Medicine; Johns Hopkins Hospital Bulletin; Il Veterinario di Campagna (Moncalieri); Le Bulletin Vétérinaire (Orleans); Revista de Medicina Veterinaria (Bucarist); La Revista Veterinaria (Buenos Aires); Zeitschrift für Fleisch-und Milchhygiene (Berlin); Buletinul Societatii de Sciinte diu Bucuresci-Romania; The Meat Trades Journal; The Dental Record.

Revue Bibliographique des Sciences Naturelles pures et appliquées; Suggestions for the General Management of Horses, Mules, and Oxen on Board Ship, &c., from the War Office; Annual Report of the Sanitary and Markets Departments of the City of Edinburgh for 1901, by A. Maxwell Williamson, M.D., B.Sc.; A Case of Tuberculosis of the Skin following Accidental Inoculation with the Bovine Tubercle Bacillus, by Mazyck P. Ravenel, M.D., University of Pennsylvania.